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SOME REMARKS ON GRAPE CULTURE.

BY HENRY SNYDER MAUGER, PH.G.

(From an Inaugural Essay).

It is well known that in some localities many of the best varieties do not succeed solely on account of their foliage being destroyed more or less by mildew, and the criterion of a useful grape depends solely upon its freedom from mildew on the leaves, and not on account of the flavor or other good qualities of the fruit; so we find that the most popular varieties are not those of the highest merit in flavor, but those that are least affected with mildew on the foliage and fruit. The most prevalent form of mildew on the leaves of our native grapes is known as *Peronospora viticola*, Berk. This is always found on the under surface of the leaf; it commences in small spots of a brownish color which adhere closely to the leaf ribs, and when the conditions are favorable it spreads rapidly and destroys the vitality of the part attacked. Its presence is made apparent by a yellowish tinge which may be seen on the upper surface of the foliage, and in clear weather these spots become brown-colored, afterwards crisp and dry, and ultimately the leaf is more or less destroyed. This appearance on the foliage is sometimes termed sun-scald, but it hardly need be stated that the leaves would not be injured by the sun were it not that their vitality is impaired by mildew; yet we frequently meet with cultivators who maintain that their vines are free from mildew, while they admit the foliage is scalded by the sun and drying off.

By the time its effects are thus visible the mildew is not so easily discerned, or it may have run its course and left but little evidence of its presence in an active state, and this may be the reason why many grape-growers show so little knowledge of the disease. Hence the

origin of so many seemingly conflicting opinions relative to the exemption of varieties of grape from mildew, owing to the effects produced by this disease being attributed to other supposed causes.

It is a disputed question whether or not mildew will attack perfectly healthy vegetation. By many persons it is held that fungoid growths only appear on disorganized vegetable or animal matters; that, previous to the appearance of the mildew on leaves, some disturbing cause has been at work on the plant, and the partial decomposition which has resulted from the unhealthy state forms proper conditions for the development of the fungus. From this reasoning it follows that, previous to the appearance of mildew, there must exist a disorganization of vegetable tissue; and before a remedy can be suggested we must first endeavor to discover the cause of the incipient disease which allows the development of the fungoid growths.

The peronospora is never found on grape-leaves which are always dry. The predisposing cause of this particular species of fungus is an excess of retained moisture on the foliage, either from continued wet and damp weather, or from heavy night dews succeeded by calm days. Grape-vines trained on trellises protected by a covering at top, so as to prevent the radiation of heat from, and the consequent deposition of dew upon, the surfaces of the leaves are never troubled by this fungus.

It is also a common observation that grape-vines growing through and over trees are never seriously injured by mildew, the protection afforded by the leaves of the tree preventing it. Branches from the same root, some of which are allowed to ramble over a tree, and others trained upon an ordinary trellis, will afford good examples as to the benefits of protection in preventing mildew. Hence it may be inferred that a good locality for vineyards is one where there is exemption from late spring frosts, from late dews during summer nights, and from early frosts in autumn; and the best results will be found where all these conditions exist, and failures will follow in proportion to their deficiency. So far as concerns entire freedom from the mildew under consideration, the conditions are found on sloping hillsides contiguous to well-defined valleys. It has long been observed that in clear, still nights during summer, dews are less frequent upon the sides of hills than they are in the neighboring valleys.

The appearance of hoar-frost in valleys during the early winter and spring seasons is produced by conditions of temperature similar to

those which cause the heavier deposition of dews in these localities. During clear nights currents of cool air run downwards on the inclined lands to the bottom of the valleys. These currents are the result of the sudden depression of temperatures sustained by the surface of the earth in consequence of rapid radiation, by which the stratum of air in immediate contact with that surface becomes specifically heavier by condensation, and descends into the valley, which then rapidly cools, while the warm air of the valley is lifted up, and impinges on the sides of the hills, and so far as this warm stratum extends there is no condensation of moisture such as occurs in the low grounds in the form of heavy dews in summer, and which in cool weather freezes and becomes hoar-frost. The effects of this stratum of warm air upon vegetation on hillsides is very well defined where early autumn frosts have destroyed the foliage of the trees below a certain line, which is sometimes called the vernal line, or line of no frost; above this line, and within the limits of the extent of the warm stratum or zone, vegetation is unharmed. The altitude to which this line reaches above the bottom of the valley is dependent upon the mean temperature of the day and night, or rather upon their comparative difference at the time of its occurrence; when the temperatures of both are high, the lower places only are affected by the frost, but when low, the frost will extend higher up on the hills. If we consider the climate conditions of localities where grapes do well, we will find that they are those which are nearly exempt from dews, and, as a consequence, all varieties of grapes retain their foliage during summer. In other words, the distinguishing peculiarity of a good grape climate is that of the entire absence of mildew on the foliage of the grape, and this is entirely independent of cultural processes of manipulation or training, or of the quality of the soil in which they are planted, although the latter may sometimes exert an auxiliary influence.

In illustration of the conditions which constitute a good grape climate mention may be made of the high lands bordering Keuka Lake, in Steuben County, New York. These steep hillsides are covered with vineyards which extend for several hundred feet above the level of the lake; the soil is shaly, and in many places the surface is very thickly covered with loose stones. On these hillsides mildew is comparatively unknown, the Catawba, Iona, Delaware, and indeed all varieties of native grapes, except those which require a longer season than the climate affords, mature to a degree of perfection which they

fail to attain in more southern but less favorably situated localities. The influence of the lake is also well illustrated in the freedom from mildew on the vines which are planted quite close to the water. Higher up the valley beyond the lake, while the vines are equally as healthy on the hills there as they are on those in the near neighborhood of the lake, the plants suffer from mildew on the lower grounds, showing that the radiation of heat from the water during night has the effect of preventing dews even on low grounds near the lake. Here we have two factors, both of which are favorable to a healthy condition of vines, or rather they prevent mildew, which is the prime result, if not the cause of unhealthiness, so far as atmospheric influences are concerned. The first of these is owing to the elevation above the valley; during the day heat accumulates in the valley, and forms a stratum of warm air, which is lifted up as the colder air rushes down the slope after sundown, and wherever this warm air strikes the hillsides dews are not found.

The second important factor is the influence of the water in effecting a healthy condition of local climate. The ameliorating influence of an extensive body of water is well understood, and a noted illustration of its value is found on the shores and on the islands of Lake Erie, which have long been popular for the extent and excellence of the vineyards and the superior qualities of the fruit which they produce. This success is fairly attributable to the modifying effect of the body of water upon the atmosphere, which secures a comparative immunity from heavy night dews during the season when vegetation is most active. The heat which the water accumulates during summer has the further effect of warding off the frosts of autumn and early winter, thus virtually lengthening the season to an equality with the climates of latitudes several degrees southward, so that grapes which ripen perfectly in the vicinity of the lake fail to mature in localities immediately beyond its influence.

For all cultural purposes it is sufficiently accurate to assume that the hardness of a grape simply depends upon its immunity from mildew. On the other hand, when a variety of our northern native grapes is said to be too tender for our winters, it simply means that it is so subject to mildew that the growths fail to ripen, as all of our native grapes of the Northern States, and indeed foreign grapes also will stand the winters, provided their young yearly growths become thoroughly matured; the summer climate rather than the winter cli-

mate decides the question of hardiness, so that when a seedling grape is announced as being perfectly hardy and exempt from rot in the berry, it may be true as far as hardiness is concerned, in the climate where it originated, if it happened to be a specially good climate, but it does not follow that it would be hardy in other parts of the country, as hundreds who have purchased such plants can abundantly testify.

Another form of mildew that may sometimes be seen on grape-leaves is a species of Erysiphe. This form appears on the upper surface of the leaves, also on the surface of the fruit, its appearance being somewhat similar to a dusting of fine flour, and may be brushed off without leaving any apparent marks of injury, but its effects are to retard growth. Young, green shoots once covered with this fungus cease to grow, and will remain green until the frosts of winter destroy them. When the fruit becomes severely attacked it cracks open, and the seeds will protrude. Green shoots will also crack if the mildew attacks them severely. Unlike the peronospora it abounds mostly in the early part of the growing season. Sudden changes of the weather from heat to cold will produce it, but our native grapes do not suffer materially at any time from this kind of mildew.

OLIVE OIL AND ITS ADULTERATIONS.

BY JOHN FRANKLIN HILDEBRAND, Ph.G.

The author's thesis contains the following survey of various tests recommended in connection with olive oil, without giving special experimental results. Olive oil is a nearly inodorous, pale greenish-yellow, unctuous fluid, with a purely oleaginous taste, peculiarly grateful to those who relish oil. It does not suffer active decomposition at a temperature not exceeding 600° F, and when cooled to below 32° F. it congeals into a granular solid mass. It is very slightly soluble in alcohol, but its solubility is increased by admixture with castor oil. It is soluble in 1½ parts of ether. When pure it has little tendency to become rancid. Specific gravity varies from about .914-.918 at 60° F. Olive oil, being, with the exception of almond oil, the most costly of the fixed oils of commerce, is consequently subject to adulterations. Nut, poppy, rape, lard and cotton-seed oils are common adulterants. Refined tallow-olein, is said to have been used in

the same way. The addition of another oil to olive oil renders it far less agreeable to the palate, and by increasing its tendency to become rancid makes it more likely to offend and derange the stomachs of those who consume it. When pure and fresh, olive oil is most wholesome as an article of food and as a condiment. In addition to the specific gravity the following tests will aid in determining its purity.

1. Olive oil loses its transparency and begins to solidify at 32° – 36° F., and is completely solidified when a small quantity is surrounded by ice or a freezing mixture; but when mixed with poppy oil it remains partly liquid, even when the latter forms only one-fourth of the mass. If more than one-third poppy oil is present, it does not solidify at all, unless cooled much below 32° F.

2. The elaidin test is a very useful one in the examination of olive oil. There are several methods of applying this test:

A. Mix the oil with $\frac{1}{12}$ part of its volume of a solution of 4 oz. mercury in 8 oz. 6 dr. nitric acid of the specific gravity of 1.5.

B. Make a mercurial solution by dissolving 6 parts mercury in $7\frac{1}{2}$ parts nitric acid, sp. gr. 1.35 without heat. Then add 1 part of this solution to every 48 parts of the oil, and shake it well every 30 minutes, until it begins to solidify. A temperature of 90° F. will cause the oil and coagulum to separate perfectly from each other.

3. Add to the oil in a test tube a small globule of mercury, or some copper turnings, and then pour in nitric acid. If the olive oil is pure, it becomes in 3 or 4 hours after the application of these tests, like a firm fat, without any separation of liquid oil, and after 24 hours the mass will be found so hard that some little force must be used to push a glass rod into it. The other edible oils do not behave in this way. The solidity of the mass is inversely proportionate to the quantity of drying oil present. When the sophistication is equal to $\frac{1}{3}$ of the whole a distinct layer separates. When the sample contains $\frac{1}{2}$ its volume of an inferior oil, $\frac{1}{2}$ only of the mixture becomes solid, and the other half remains liquid. When the adulterant is an animal oil, the mixture solidifies in about 5 hours.

But in this case the coagulum contains the animal oil, whilst the olive oil floats on the surface, and may be decanted off for further examination. The coagulum in this case when heated, exhales the odor of rancid fat or tallow.

Bach's method of testing olive oil with nitric acid: 5 c.c. of sample are shaken in a convenient tube with 5 c.c. of nitric acid, sp. gr.

1:30, for one minute and the resulting color observed, after one minute; after five minutes in boiling water; and the consistence noted after standing from 12 to 18 hours at about 60°F.

		COLOR.		CONSISTENCY.
Pure		1 Min.	5 Min.	
Olive	Oil	Pale Green	Orange-Yellow	Solid
Cotton Seed	"	Yel.-Brown	Reddish-Yellow	Smeary
Sesame	"	White	Brownish-Yellow	Liquid
Peanut	"	Pale Rose	" "	Solid
Rapeseed	"	" "	Orange-Yellow	Solid
Ricinus	"	" "	Golden-Yellow	Smeary

Mixtures of olive oil with small amounts of cotton-seed and sesame oil are distinguished by the entire mass, though at first *more darkly colored* and solidifying like pure olive oil, yielding after 24 to 36 hours a brown oil upon the surface of the solidified mass, whilst the lower layer shows the yellow color of the pure olive oil.

Oils which have been treated with alkalies show the same reactions as the pure oils. The melting and solidifying points of olive oil are so far from those of the other oils that adulteration with them, to the extent usually occurring in commerce, can be readily detected by noting the melting and solidifying points.

The following are simple tests for the most common adulterations:

Linseed oil.—Dip a polished copper wire into a mixture of 2 c.c. nitric acid with 5 c.c. of the oil; within half an hour the wire will have turned rose-red.

Cotton-seed oil.—A mixture of solution of sub-acetate of lead and pure olive oil remains homogenous, and the color is very little altered. The presence of even a small quantity of cotton-seed oil turns the color red.

Rape oil.—Saponify a portion of the oil with an alcoholic solution of potassa and stir diligently with a silver spoon, which will turn black. The solution of potassa must not contain sulphur.

Sesame oil.—Dissolve a piece of rock candy in 2 c.c. hydrochloric acid, sp. gr. 1.15, and shake well with 5 c.c. of the oil. The separated acid is colored red.

Antifibrin.—According to Prof. Bartholow, physiological and clinical observations demonstrate the efficacy of *antifibrin* in *epilepsy*, where there is a slow, feeble circulation, as seen by retinal examinations. Doses of gr. iij *ter die* will usually suffice.—*Coll. and Clin. Rec.*, July.

PRACTICAL NOTES FROM VARIOUS SOURCES.

BY THE EDITOR.

Test for watered milk.—The readiness with which diphenylamine is rendered deep blue by nitric acid and other oxidizing agents was pointed out by A. W. Hoffmann, in 1864. Since well water always contains more or less nitrates, Szilasi (*The Lancet*, June 11th,) recommends the detection of such water in milk by the following simple test: About twenty minims of solution of sulphate of diphenylamine are placed in a small porcelain vessel, and a few drops of the milk to be examined are added to it. If the milk contain even five per cent. of average well water a blue tinge will gradually distinctly appear. Sulphate of diphenylamine is very cheap, so the test may be readily tried.

Capsules of creasote and Tolu balsam have been successfully employed by Dr. Sommerbrodt (*Berl. klin. Woch.*, N. 15) in the earlier stages of phthisis. Each capsule contains 0.05 gm. ($\frac{3}{4}$ grain) of creasote and 0.02 gm. ($\frac{1}{4}$ grain) of balsam of Tolu. With due caution in the beginning of the treatment, the system becomes quickly accustomed to the medicine. Some patients have taken from 600 to 2000 of such capsules during the continuance of the treatment.

Oralic acid has been found by Dr. F. Poulet (*Phil. Med. Times*) to be a valuable emmenagogue; it was employed as follows:

R	Acidi oxalici.....	1.0
	Aquæ	100.0
	Syr. cortic. aurantii am.....	30.0

M. Sig. A teaspoonful every hour.

Atropine santonate is recommended by Bourbelon (*Med. and Surg. Rep.*) as a staple compound, the solution of which produces no irritation when applied to the eye, whilst its power of dilating the pupil is the same as that of atropine sulphate. One drop of solution of atropine santonate containing one part in 2000 of water dilates the pupil in six minutes, and the action is maintained for a period varying from ten to twenty-four hours. Atropine santonate has not been hitherto obtained in a crystalline state. It appears in the form of a white powder which has no hygroscopic properties. It is requisite to observe that the santonate and its solutions ought to be preserved in flasks of yellow glass, in order to avoid the action of light and the formation of photosantononic acid. If the solution is made with cam-

phor water it causes slight smarting when first introduced into the eye. This, however, soon passes off, and has not been attended, in any case hitherto observed, with troublesome consequences.

Dusting powder of salol has been used by Dr. Georgi (*Berl. klin. Woch.*, 1887, No. 9) in facial erysipelas. The powder consists of equal parts of salol and talc. It was also found useful for removing the bad odor in ozæna, the insufflation being repeated every two hours.

Mouth-wash and gargle of salol.—Dr. Seifert (*Centralb. f. klin. Med.*, April 2, 1887,) recommends a solution of six parts of salol in one hundred parts of alcohol; a spoonful of this liquid mixed with a glass of warm water is used as a mouth-wash or gargle in stomatitis and other affections.

Calming collodion, suitable for neuralgia or for tender abraded surfaces, is recommended by A. S. Gubb (*Lond. Med. Rec.*) to be prepared from powdered mastic three parts, powdered narcotine one part, balsam of Peru one part, and chloroform six parts. (See also antiseptic collodion, p. 294.)

Antarthritic collodion, said to be very useful in gout, is made by Monin (*L'Union méd.*) from flexible collodion and ether, of each 15 parts, salicylic acid four parts, and morphine hydrochlorate one part. It should be applied to the toe every hour; the pain will soon cease and the swelling subside.

Hair tonic.—Dr. Foley, in discussing the tonic treatment of the hair (*N. Y. Med. Jour.*), states that the end we seek in building up a scanty hair crop is a proper amount of blood supply, through friction and hair tonics. The appended is an excellent hair tonic:

R. Acid. carbolic.....	3 ss
Tinct. nucis vom.....	5 ij
Tinct. cinchonæ rubræ.....	3 j
Tinct. cantharidis.....	3 ss
Aq. Coloniensis	
Ol. cocois,	āū q. s ad 3 iv. M.

Apply once or twice a day to the scalp by means of a soft sponge. This will prevent the hair from falling out, if it does not produce a luxuriant crop.

Effect of creasote on the hair.—Dr. C. J. Kelly reports (*Prov. Med. Jour.*, May 2) the case of a man who by mistake had used creasote in the place of hair oil; on the following morning the color of the hair was observed to have commenced to change, and in a few days it was quite gray.

Inhalations of carbolic acid have been found serviceable in whooping-cough by Dr. R. Pick, Dr. W. Jakobski, and others. The latter (*Brit. Med. Jour.*, April 30) devised an instrument like a toy, consisting of a pasteboard tube ornamented and provided with a handle. Within the tube are two thread nets and between them a layer of cotton wool moistened with the solution. With this Dr. Jakobski found no difficulty in getting the little patients to take the inhalation. A fifty per cent. solution of carbolic acid was used and the inhalations continued for ten minutes every two hours.

ABSTRACTS FROM THE FRENCH JOURNALS.

[Translated for the AMERICAN JOURNAL OF PHARMACY.]

PEPTONE DE SERINE.—A. Raynaud, a French pharmacist, gives this name to a peptone for hypodermic use, which he describes in the *Bull. Gén. de Thérap.*, July 30th. He says that while the peptones in use answer for use as peptonates of mercury, iron, etc., they often give so much pain when united to other drugs that their use has to be discontinued. He proposes the following: Albumen from pure blood, 5 gm.; extractive pepsin, dialysed, 75 centigm.; distilled water, 75 gm.; hydrochloric acid, pure, 19 drops. This is digested for three days at 46° C. The liquid is then clear, and analysis shows it to contain:

Insoluble residuum.....	0.490
Syntonine.....	0.125
Dry peptone.....	3.940
Salts separated by dialysis	0.96

After purification by dialysis, concentration and evaporation by heat, on sheets of glass, this peptone appears as light-colored hygro-metric scales. Taken up by distilled water and precipitated by absolute alcohol, a very pure white powder is obtained, which would replace advantageously, the peptones of fibrin as having a composition approaching as nearly as possible to that of the blood and having the qualities needed for ready absorption.

RADIX HELLEBORI VIRIDIS has been studied by Tschistowitsch (*Nowosti Ther.*, No. 3, 1887; *Bull. Gén. de Thérap.*, July 15th, 1887), to ascertain its value in various cardiac affections during the period of non-compensation. His conclusions are as follows: In six cases the

medicament (15 drops of a solution of 1 to 100 of the aqueous extract every two hours), produced a diminution in the frequency and an augmentation of the force of the cardiac pulsations; increase in the quantity of urine eliminated, and a prompt disappearance of the symptoms of non-compensation. In two cases the amelioration was obtained by the simultaneous administration of the infusion of *helleborus viridis* and that of *adonis vernalis*, though neither of these, given separately, produced the desired effect. In three complicated cases, two with nephritis and one with pleurisy, the medication gave negative results.

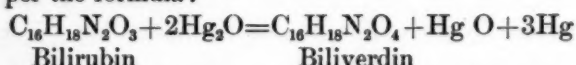
PEGANUM HARMALA, LIN. (*Nouv. Rem.*, July 8th) is described as an "African drug," although it grows as well in the sands of Spain, the Crimea and Siberia, as in Egypt. The entire plant is regarded as sudorific and emmenagogue. Dr. Pandurel, of Bombay, who prescribed it in infusion and tincture, regarded it a powerful emmenagogue, determining slight toxic effects similar to those of *Cannabis indica*. The dose in amenorrhœa is given at two drachms of the tincture. Egasse, who thinks the drug merits careful study, says that "the energetic action of the aqueous or alcoholic preparations is explained by the fact that the red, resinous coloring matter is a secondary product formed by the oxidization of the harmaline. For account of the important constituents see *AMER. JOUR. PHAR.*, 1886, p. 89.

HYDRIODATE OF HYOSCINE is referred to in *Nouveaux Remèdes*, Aug. 8th, as "the best of the brain sedatives," as hydrobromate of hyoscine was found (in the same journal, Aug. 15th, 1886, *AMER. JOUR. PHARM.*, 1886, p. 603), to be a hypnotic in mental maladies. Its information concerning the former seems to have been gained from *The Provincial Med. Jour.*, Jan., 1887. Hypodermic injections of 1 to 200 of the hydriodate of hyoscine may be given. Doses by the mouth are administered in from $\frac{1}{16}$ th to $\frac{1}{32}$ th of a grain. Chloral is stated to have the power of neutralizing the effects of hyoscine.

SOLANINE.—In a long study (*Bull. Gén. de Thérap.*, July 15th, 1887), Dr. Gaignard arrives at the following conclusions: 1. Solanine is a glucoside which does not combine with acids to form salts; under the influence of acids it decomposes into solanidine and glucose. 2. It is absolutely insoluble in water, without it be strongly acidulated, and is sparingly soluble in alcohol, ether and the oils. 3. Solanine cannot be used in hypodermic injections, the acid solutions being too caustic.

Maintained in suspension in a convenient vehicle, its own action is still more caustic. It is therefore necessary to use pills, and these should contain 10 to 20 centigrammes. The daily dose of 30 to 40 centigrammes is very well supported by patients. 4. Despite the opinion of writers who have studied this substance, we believe that it should not be classed among our best analgesics. 5. Its high price, its want of uniformity of action, and the high doses that it is necessary to prescribe do not permit us to counsel its use as an analgesic. (See also *AM. JOUR. PHAR.* 1887, p. 102.)

INFLUENCE OF CALOMEL UPON THE DECOMPOSITION OF BILE.—Zawadsky, after a long and carefully made series of laboratory researches, cites the following conclusions: 1. Calomel has an antiseptic action upon the bile and the contents of the intestine. 2. This is explained by the transformation of the calomel in the bile and in the intestine, into Hg_2O , a transformation favored by the alkaline reaction of the contents of the intestine. 3. The characteristic color of the excrements—observed after the administration of the calomel—depends: *a*, on the one hand, upon the transformation of bilirubin (perhaps of hydro-bilirubin) into biliverdin, under the influence of Hg_2O , as per the formula:



with the liberation of metallic mercury; and *b*, on the other hand, of the presence of biliverdin (a normal constituent of bile) which was prevented from decomposition on account of the antiseptic action of the calomel and of Hg_2O . 4. The acid reaction of the medium, as also the other unfavorable conditions of the juice, explain probably, the absence of color in the excrements characteristic in some cases after taking calomel. *Laboratoire pharmacolog. du Prof. Toumass, Wratsch*, Nos. 15 and 16, 1887; *Bull Gén. de Thérap.* July 15, 1887.

Sulphurous acid in whooping cough.—A Norwegian physician named Mohn discovered after disinfecting the bedding of one of his own children who had suffered from scarlet fever, that another child who had whooping cough and who accidentally inhaled some of the fumes of the sulphur, was suddenly cured of the disease. Acting on this suggestion, he has treated other cases of pertussis by placing the patients in a room where sulphur had been burned in the usual manner in which it is employed for disinfectant purposes. He claims that after being put to bed in such a room, the patients awake the next morning cured.—*N. E. Med. Monthly.*

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Ustilagine is the name of an alkaloid which Dr. C. J. Rademaker and J. L. Fischer, Ph. G., have isolated from *Ustilago maydis* (*Med. Herald*, April 1887, p. 775). The cornsmut is exhausted with dilute alcohol; after the alcohol has been spontaneously evaporated from the tincture, a little sulphuric acid is added, the mixture is dialyzed, the dialysate evaporated to dryness, the residue washed with absolute alcohol, dissolved in water, rendered alkaline by potassa in excess, agitated with ether, and the ethereal solution evaporated spontaneously. The crystalline alkaloid is white, bitter, of an alkaline reaction, and soluble in ether, alcohol and water; sulphuric acid produces a maroon color changing to green; ferric chloride colors yellow. The salts are crystallizable and soluble in water.

The other constituents found were: fixed oil, 6.5, resin, 8.0, and wax, 5.5, soluble in petroleum-benzin; trimethylamine, 1.5, sclerotic or maisenic acid, 2.0, wax, 6.25, and resin, 4.5, soluble in ether; sclerotic acid, 0.5, and resin, 3.5, soluble in alcohol; sugar, 3.75, pectin, 2.25, salts, 4.5, and extractive, 9.5, soluble in water. The authors believe trimethylamine not to be a product of decomposition of the albuminoids. Another alkaline body, but non-crystallizable, was obtained, which will be further investigated.

The acid called sclerotic acid is described as crystallizing in needles, to be soluble in water, alcohol and ether, and to yield crystallizable salts. It does not appear to be identical with Dragendorff's sclerotic acid.

Drosera Whittakeri grows plentifully on the hills near Adelaide, South Australia, and is conspicuous in the spring time by its pretty white flowers, resembling those of oxalis. From the tubers of this plant Mr. Francis extracted, by means of carbon bisulphide, a volatile red-coloring matter, which produced on silk beautiful tints with various mordants.

Prof. E. H. Rennie (*Jour. Chem. Soc.*, 1887, p. 371,) prepared the coloring matter by exhausting the crushed tubers with hot alcohol, distilling the tincture, adding water and subliming the precipitate. The sublimate, by repeated recrystallization from alcohol or acetic acid, was separated into brilliant red plates, $C_{11}H_8O_6$, and into more freely soluble orange-colored needles, $C_{11}H_8O_6$, both being, in all probability, derivatives of methylnaphthaquinone.

Heritiera littoralis, Aiton, nat. ord. Sterculiaceæ, is a tree growing in Eastern Africa, India, the Philippines and Australia. All parts of it are astringent, and the red brown seeds have also a bitter taste. Heckel and Schlagdenhauffen (*Nouv. Rem.*, 1887, p. 123,) have observed these seeds as an adulteration of kola nuts. They are readily distinguished from the latter by their nearly orbicular and flattened shape, with a diameter of about 4 cm. and a thickness of 10 to 12 mm., and by one of the fleshy-white cotyledons being only of about half the size of the other. The starch grains are polygonal, and only one-half the size of those of the kola nut. These *false kola nuts* do not yield any caffeine; they contain fixed oil, 4.4 per cent.; tannin and coloring matters, 5 per cent.; sugar, 5.7 per cent.; cellulose and starch, 56 per cent.; lignin, 12.4 per cent.; albuminoids, 13.5 per cent., and salts, about 3 per cent.

Cali nuts are described by E. Merck (*Chem. Centrabl.*, 1887, p. 343). They come from the west coast of Africa, are the seeds of a papilionaceous plant, and have a more circular shape than Calabar beans, but otherwise agree with the latter in all essential external characters. These cali nuts contain an alkaloid which closely resembles physostigmine in chemical properties and physiological action.

Acacia delibrata, A. Cunn.—Dr. T. L. Bancroft observed (*Australian Jour. Phar.*, March, 1887, p. 103) that the pod has not an astringent, but a disagreeable acrid taste. The acrid principle when isolated, was dirty-white, not crystalline, had a faint odor and an extremely nasty taste, and was soluble in water and alcohol, the aqueous solution frothing on agitation; it is a glucoside and by its chemical and physiological behavior related to, or identical with, saponin.

The ash of *ipecacuanha* root was found by H. E. Munns, (*Phar. Jour. Trans.*, April 30, 1887, p. 898) to amount to 3.22 per cent., and to have the following composition: Silica 31.98, iron and alumina, 3.53, Ca O 15.98, Mg O 4.57, P₂ O₅ 6.19, alkalis 13.80, SO₃ 4.84, Cl 1.56, CO₂ 15.25, undetermined and trace of manganese 2.30.

Roasted coffee.—Paul and Cownley have continued their experiments on coffee, (see February number, p. 94) and ascertained that there is no appreciable loss of caffeine by volatilization in the roasting operation when it is carefully carried out. The loss of weight in roasting is from 13.7 to 16 per cent., and the product consists mainly of water with a minute quantity of volatile acid, probably acetic, and

a little empyreumatic oil. In roasting coffee on a large scale, a portion of the water is at first condensed upon the cooler portion of the charge, where it dissolves some caffeine; this solution is absorbed by the thin membrane, and the latter, as the roasting progresses, is detached and carried off into the flue; this appears to be the source of caffeine in the "flights." Properly roasted coffee contains 1.3 per cent. of caffeine, but in an over-roasted coffee, which had lost 31.7 per cent., only 1.25 caffeine was found, while by calculation it should have contained 1.61 per cent.

Infusion of coffee, prepared by percolation from $\frac{1}{2}$ oz. of coffee with sufficient boiling water to yield 3 fluid-ounces, was found to contain 45 grains of extractive, including 2.36 grains of caffeine, about 12 per cent. of the latter remaining in the grounds (from which it may be exhausted by more water). A cup of coffee made in the way indicated may be expected to have a marked effect as a stimulant.—*Phar. Jour. and Trans.*, April 9, 1887, p. 821.

Nettle poison.—Some time ago Dr. G. Haberlandt, in a paper read before the Academy of Sciences, at Vienna, opposed the generally accepted view of the presence of formic acid in the stinging hairs of *Urtica dioica* Lin., and *U. urens*, Lin., showing that formic acid had no such virulent properties in the minute quantities in which it could be present in the nettle hairs; he considered it probable that the poison was a non-volatile albuminoid compound, perhaps an unformed ferment.

David Hooper, however, shows (*Phar. Jour. and Trans.*, April 9, 1887, p. 822) that the Nilgiri nettle (*Girardinia palmata*, Weddl., contains in its hairs a volatile acid, reducing permanganate and salts of silver and mercury, and forming a lead salt soluble in water, but insoluble in alcohol; this behavior points to formic acid. The solid contents, obtained on evaporation, consisted apparently of albuminous matter with a trace of ash.

Euphorbium consists, according to G. Henke, (*Archiv d. Phar.*, 1886, p. 729-759,) of 34.6 euphorbone, 26.95 resin soluble in ether, 14.25 resin insoluble in ether, 1.1 caoutchene, 1.5 malic acid, 20.40 gum and salts, of which two-fifths are precipitated by alcohol, and 1.2 other substances soluble in ammonia. *Euphorbone* is extracted by petroleum benzin (boiling point 65°C. = 149°F.), and is best purified by dissolving in ether, adding alcohol until a permanent turbidity

dity appears, allowing the yellow resin to subside, evaporating the clear liquid and crystallizing from benzin. It forms glossy white needles, is tasteless, melts between 67° and 68°C. , is dextrorotatory and has the composition $\text{C}_{20}\text{H}_{36}\text{O}$. It has a neutral reaction, is freely soluble in benzin, benzol, chloroform, acetone, ether and strong alcohol, is almost insoluble in hot water, and is not affected by diluted acids and by alkalies.

Aristolochia cymbifera, *Martius*.—The root of this plant has again appeared in the European drug market, and consists of pieces about 10 cm. (4 inches) long, gray-brown, longitudinally wrinkled, the thickest roots being split; the transverse section shows a rather thick bark, and a ligneous cylinder, which is distinctly radiating, and contains wide dotted ducts and wood-fibres; the bark and medullary rays contain much starch, and in numerous but slightly enlarged cells, a mixture of yellow resin and volatile oil.—*Chemiker Ztg.*, 1887, p. 379.

The root is known in Brazil as *milhomem*, also as *jarra* and *jar-rinha*, and has a camphoraceous odor, resembling that of *serpentaria*, and a bitter and pungent taste. The roots of a number of other species of *Aristolochia* have similar properties and are also used under the same names as the preceding, the medical properties being analogous to those of *serpentaria*. The drug has been repeatedly used in Europe during the last century and more recently, but does not appear to be superior to other well known remedies.

Cryptocarya australis, *Bentham*; nat. ord. Lauraceæ.—In a paper read before the Royal Society of Queensland, Dr. T. L. Bancroft states (*Austral. Jour. Phar.*, March 1887, p. 103) that the bark is persistently bitter and has a toxic action, due to the presence of an alkaloid crystallizing in stellately arranged needles. When given to warm blooded animals respiratory difficulty is produced, ending in asphyxial convulsions and death. It has also a poisonous action on reptilia.

Daphnandra repandula is a new species found by Dr. Bancroft near the Johnstone river. All parts of this species have a peculiar transient bitter taste; the inner surface of the fresh bark is white, but becomes metallic black on exposure to the air, and again loses this color on drying. The aqueous extract is very poisonous, 10 grains being a fatal dose for warm-blooded animals, and is very rich in alkaloids, all of which, Dr. Bancroft states, are colorless and crystalline. The ac-

tive alkaloid is soluble in water and to some extent is antagonistic to strychnine. *Daphnandra* retards the development of bacteria, deodorizes putrid meat, checks the growth of the yeast plant, and kills some water plants.

Daphnandra micrantha, *Bentham*, has similar properties; it is a shrub growing in the neighborhood of Brisbane.

Curacao aloes.—Prof. W. Støeder has examined the aloin prepared from this variety by Tilden's process (*Nieuw Tijdsch. Phar. Med.*, p. 98; *Phar. Jour. Trans.*, April 2, 1887). The yield was 5.5 per cent. It is odorless, bitter, melts giving off the odor of caramel, is almost insoluble in chloroform and ether, moderately soluble in water and very soluble in spirit. The yellow, aqueous solution reduces Fehling's solution, is rendered darker and red by ammonia, and, on being heated, becomes red, beginning with the upper layer. Sulphuric and nitric acids color it a pure red, but on stirring, the mixture becomes yellow. If then the vapor of fuming nitric acid be passed over it, a grayish-blue color is produced, which quickly disappears. Bromobromide of potassium gives an abundant precipitate, but tannin gives no precipitate. Thus Curacao aloin resembles nataloin in the effect produced by fuming nitric acid, and is like barbaloin and socaloin in the formation of a bromo-derivative, but differs from barbaloin in not giving a precipitate with tannin.

MEXICAN LIGN ALOES.

By E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

Although the essential oil bearing the above name has been a commercial article for many years, and was noticed in the columns of this journal by Mr. J. Collins as long ago as 1869, yet nothing definite has been ascertained concerning its botanical source until quite lately. Three years ago a description of the tree yielding the oil was published by M. Poisson in the *Bull. de l'Assoc. Franc. pour l'Avancement des Sciences*, xiii., p. 305, pl. x. (Blois, 1884), but in consequence of the difficulty of access to this publication it has been overlooked even by the authors of the 'Biologia Centrali-Americana,' and it was only during a recent visit of Professor Baillon to the Museum of the Pharmaceutical Society that my attention was called by him to the article

in question. It seems desirable, therefore, to place on record in this Journal an abstract of that paper.

M. Poisson was led to inquire into the botanical source of the product through seeing specimens of the wood and oil at the Paris Exhibition of 1878, where these products were exhibited by Messrs. Ollivier and Rousseau, of Paris. These gentlemen obtained specimens of the leaves, flowers and fruit from their correspondent in Mexico, M. Delpech, in whose honor the tree has been named by M. Poisson. The description he gives of the tree is as follows:—

"*Bursera Delpechiana*.—Foliis apice ramulorum congestis, tenuibus novellis utrinque, imprimis subtus, costis et nervis tenuiter pilosis, 3 jugis; foliolis ellipticis, utrinque acutis, crenato-serratis; interstitiis inter juga anguste alatis; paniculis folia æquantibus breviter pilosis, compositis, laxifloris, bracteolis angustissime linearibus, pedicellis tenuissimis, calycis lobis brevibus deltoideis atque petalis oblongis 5 poll. longioribus, sparse et longe pilosis, staminibus quam petala paullo brevioribus, filamentis quam antheræ oblongo-ovatae 4 poll. longioribus; drupis ovoideis glabris."

"Folia 5-6 cent. longa, interstitiis interjugalibus 7-8 mill. longis, 1-1½ mill. latis; foliola 1½-2 cent. longa, 8-10 mill. lata, nervis lateralibus 1½-2 mill. distantibus. Paniculae (e cymis compositae) axillares numerosae 5-7 cent. longae, ramulis secundariis 1½-2 cent. longis, pedicellis 3-4 mill. æquantibus, bracteolis tenuissimis 2-4 mill. longis. Calycis lobi vix 1 mill. longi. Petala (æstivatione valvata) 4 mill. longa, 1 mill. lata. Stamina filamenta 3 m. longa, antheræ vix 1 mill. æquantes. Drupæ fere 1 cent. longæ. Mexico circa urb. dict. Cuantla Morelos."

The species is characterized by the excessive brevity of the calyx, of which the lobes are not well marked. It belongs to the set of species peculiar to Mexico, including *B. Aloexylon*, Engl., and *B. penicillata*, Engl. The tree is of medium height. According to M. Delpech, the wood in a fresh and healthy state is almost devoid of odor, and it is only where a branch has been broken off or insects have pierced the wood that the oil becomes developed.¹ He states that old trunks may afford as much as 10 to 12 per cent. of oil. This difference in the wood is not recognized by the native Indians who collect it, and consequently the tree is felled in a reckless manner, so

¹ The section of wood in the Museum of the Society is about 6 inches in diameter, but shows no sign of insect-boring.

that it has almost disappeared from Cuantla Morelos, where it formerly abounded. The pure oil is obtained by M. Delpech by distillation by steam heat, and costs 20 to 25 francs per kilogram; an inferior oil prepared by the natives is sold for a lower price.

The structure of the wood presents the following characters. The fibres are of medium length with the walls only slightly thickened; each is divided transversely by numerous thin walls constituting a kind of ligneous parenchyma, of which the whole wood is formed. On transverse section the fibres are seen to be all of equal thickness, so that it is not easy to distinguish the zones of growth of the wood.

The vessels are of large size, with numerous transverse trabeculae, which on longitudinal section are seen to give a moniliform appearance to the vessels; they are dotted all over, the dots being surrounded with areolae.

The medullary rays are thin, and have two to four courses of cells in thickness. It is chiefly in the fibres and medullary rays that the nearly solid odorous substance occurs. It is of a yellowish resinoid aspect under the microscope, and fills them either wholly or partially. All the fibres, however, do not contain it, and it is most abundant where the wood is streaked with dark veins. This matter is soluble in alcohol, so that the wood treated with spirit becomes transparent under the microscope. In the green and healthy state the wood presents the same appearance, without any trace of oil, although at the same time the oil may be perceived in the fruits and bark by rubbing them. In M. Léon Marchaud's memoir on the "*Organization of the Burseraceae*," a somewhat similar occurrence is mentioned. The resinous and perfumed matter of *Balsamodendron Myrrha*, *B. africanum* and *Protium obtusifolium* is localized in the pith of the young branches to some degree, but is abundant in the bark and pericarp of the fruits of these plants.

The oil of lign aloes has been examined by Messrs. Verneuil and Poisson. Their experiments show that the wood cut into shavings readily yields the oil by distillation with steam, 7 to 9 per cent. being thus obtained, and the wood when dry is then found to be free from odor.

When the oil is dried over chloride of calcium, it distils over almost entirely between 189° and 192°, a small quantity of a resinous body of a much less volatile character remaining in the still. It is an oxygenated body having the formula $2 (C_{10}H_8) 5 H_2O$, this for-

mula answering to that of a hydrate of terebenthene or of an insomer. The oil slowly absorbs oxygen and becomes resinified. It does not combine with bisulphite of sodium. The red-brown coloration which it takes under concentrated sulphuric acid is analogous to that which turpentine produces with the same acid. The odor of the oil is likened by M. Poisson to a mixture of lemon and jasmin. The specimens that I have seen have more resemblance to bergamot in odor.

It is difficult to say whether other species of *Bursera* yield this oil or no. M. Poisson suggests that it is probably obtained also from *Bursera Aloexylon*, Engl. (*Elaphrium Aloexylon*, Schiede).

The new Mexican Pharmacopœia (1884), p. 75, also gives *Amyris linaloe*, La Llave, which is a synonym of *Bursera Aloexylon*, Engl., as the source of the oil.

Schlechtendal, however, in 'Linnaea' (1843), xviii., p. 303, remarks that this species has a fennel-like odor. A specimen in the Kew Herbarium, presented by Mr. Piesse as the Lignaloe plant, is labelled "*Elaphrium graveolens*, K.," from the West coast of N. Mexico. This identification is, however, according to Professor Oliver, somewhat uncertain. Several other species of *Bursera* grow in the same district, as *B. Delpechiana*, including *B. bicolor*, Engl., *B. Schiedeana*, Engl., and *B. jorullensis*, Engl., but nothing appears to be known about the oil of these trees. Schlechtendal mentions, *i. e.*, that *Elaphrium glabrifolium* (= *Bursera penicillata*, Engl.) has a strong aromatic odor, and that *Amyris ventricosa* (= *Bursera fagaroides*, Engl. var.) has an odor of caraways. The Mexican species of the genus appear to be very numerous, and require further examination as to their economic products. It is, however, satisfactory to be able to refer Mexican oil of lign aloes with certainty to one species, for there can be no doubt that *B. Delpechiana* is one of the principal sources of it.—*Phar. Jour. and Trans.*, Aug. 13, 1887, p. 132.

"Delirium after salicylate of sodium."—Schiffers *Progrès Méd.* records a case in which an enema containing 75 grains of salicylate of sodium was administered to a girl of seven, suffering from mitral insufficiency. Delirium supervened, with hallucinations of vision. Speech was slow and difficult, answers to questions being indistinct and confused. There were no motor disturbances. The symptoms disappeared without treatment in one day.—*Med. Chronicle.*

NOTE ON THE SEPARATION OF HYGRINE FROM COCAINE.

BY WM. C. HOWARD, PH.D.

The question whether amorphous cocaine and hygrine are identical, the great difficulty attending the separation of cocaine from the basic mass, and also Dr. Stockman's paper on "Amorphous Cocaine" (*Pharm. Jour.*, April 23, 1887) led me to doubt the existence of an amorphous cocaine.

The plan of separating the basic principles by means of their platinum salts I have before found useful in dealing with alkaloids, and so tried it on the solution of cocaine in hygrine. The liquor containing the cocaine, hygrine, etc., was neutralized with hydrochloric acid; the amount of heat given off proved that strong alkaloids were present. It was then fully precipitated with platinum chloride, allowed to stand for a night, and filtered off. The mixed salt was amorphous or semi-crystalline, and rather light in color. This was then washed with a large quantity of water at about 80° C.; a higher temperature was tried, but the salt caked.

The soluble salt decomposed with sulphuretted hydrogen, shaken into ether and the ether evaporated off gave a base that, when cold, crystallized. This base was then dissolved in acid, and shaken into light petroleum ether, and the ether evaporated off. The base crystallized at once. The platinum salt of this proved to be a light-colored, bulky, semi-crystalline precipitate; it was dried, washed with carbon bisulphide to remove sulphur, and finally dried over sulphuric acid and analyzed:

I. 0.1878 gram gave 0.0358 gram platinum.

II. 0.2362 gram gave 0.0455 gram platinum.

Reckoned for. Found.

(C₁₇H₂₁NO₄HCl)₂PtCl₄.

I.

II.

Pt. 19.38 per cent.

Pt. 19.06 per cent.

19.26 per cent.

The base giving the soluble platinum salt then was cocaine, and the strong anæsthetic effect confirmed the analysis.

The insoluble platinum salt was then decomposed with sulphuretted hydrogen, shaken into ether, and the ether evaporated off, leaving the base as a fluid in which, though on standing it thickened considerably, no crystals appeared in a week or more. According to Lossen (*Annal. der Pharm.*, cxxi., 374) hydrochlorate of hygrine crystallizes freely. The base smells of trimethylamine, has no bitter taste, and

gives a platinum salt which is decomposed by heating the liquid. The base I obtained gives no crystallizable hydrochlorate. The smell does not remind one of trimethylamine. It has an intensely bitter taste, and the platinum salt stands hot water well. It seems, therefore, probable that either Lossen's base was impure, or that mine is a different base altogether. He unfortunately also gives no analysis.

The platinum salt, which is darker in color, and much less bulky than the soluble salt, differs in composition, as shown by the following analysis:—

I. 0.1488 gram gave 0.0275 gram platinum.	
II. 0.1894 gram gave 0.0353 gram platinum.	
I.	II.
Pt. 18.48 per cent	18.6 per cent.

The base was, as above mentioned, extremely bitter, and is probably a body containing three atoms of carbon more than cocaine; it produces no numbing effect on the tongue.

Amorphous cocaine has, therefore, as far as I can judge, no existence, but is a solution of cocaine in the base above described. I hope to continue my research on this alkaloid if I can obtain enough material, as it is only contained or formed in small quantities.—*Phar. Jour. and Trans.*, July 23, 1887, p. 71.

THE ALKALOIDS OF COCA LEAVES.¹

By O. HESSE.

According to the observations I have made in reference to this subject, I have not become acquainted with anything to support the opinion put forward by Stockman, that amorphous cocaine is a solution of true cocaine in hygrine, although the amorphous base may contain some hygrine as the result of decomposition of some one or other coca base, and though hygrine may be separated from it by continued distillation with water, owing to its gradual formation, until the whole of the amorphous base is decomposed. Since the dilute solution of hygrine in hydrochloric acid has a strong blue fluorescence, this character furnishes a means of ascertaining whether or not hygrine is present in coca leaves. For this purpose it is only requisite to moisten the finely-divided leaves with ammonia, and shake with ether,

¹ From the *Pharmaceutische Zeitung*, July 16. Reprinted from *Phar. Jour. and Trans.*, July 23, 1887.

then to extract the bases taken up by shaking the ether solution with dilute hydrochloric acid. When sound leaves are operated upon in this way the acid solution obtained presents at first no fluorescence, but after a time it gradually becomes distinctly fluorescent, showing that hygrine is a product of subsequent decomposition.

Hygrine is separated from solution in acids by ammonia or caustic soda solution as a colorless oil, with a basic reaction and a peculiar odor which crude cocaine sometimes possesses. Its solutions in dilute acids present a fine blue fluorescence. The solution in excess of hydrochloric acid gives, when mixed with chloride of lime solution and excess of ammonia, only a milky turbidity, but no coloration. A solution of the hydrochlorate also gives no color when mixed with ferric chloride; with gold chloride it gives a yellow oily precipitate, and with platinum chloride a pale yellow crystalline precipitate.

As regards the amorphous portion of the coca bases which can be easily separated from cocaine, the above-mentioned fluorescent character of hygrine admits of the presence or absence of this base being ascertained. The material I operated upon contained no hygrine, and it gave a platinum salt that yielded in two experiments 18.26 and 18.44 per cent. of platinum, the amount of water being respectively 5.00 and 5.50 per cent. These results would correspond satisfactorily with the formula



according to which the amorphous base would appear to have the same composition as cocaine. It is, however, evident that this amorphous material is not homogeneous, since I was able to separate from it by fractional precipitation a well-defined base, to which I have given the name of "cocamine," but I must add that at present I have only been able to obtain this base from a small-leaved variety of coca.

This new base has the same empirical formula as cocaine, $C_{17}H_{21}NO_4$. It dissolves readily in alcohol, ether or chloroform, and on evaporating these solutions, it remains in an amorphous condition. It dissolves with difficulty in petroleum spirit and in water. Dilute acids dissolve it readily, and ammonia produces in these solutions a voluminous flocculent white precipitate that appears crystalline under the microscope. The hydrochlorate of this base, $C_{17}H_{21}NO_4HCl$, is amorphous, has a neutral reaction, and is readily soluble in water and alcohol, but these solutions soon become acid. When dried at 120° C. the salt continues to lose weight, and eventually becomes no longer

soluble in cold water, but communicates to it an acid reaction. On the contrary the crystalline platinum salt, $(C_{17}H_{21}NO_4)_2PtCl_6H_2 + 4H_2O$, only loses its water of crystallization at that temperature.

Cocamine melts at about $80^\circ C.$, and it decomposes when heated a little above $100^\circ C.$, or when boiled with an alcoholic solution of baryta. In this latter case an acid is produced which crystallizes from ether in needles like benzoic acid, but does not appear to be identical with it, since the ammonia salt gives with lead acetate a white flocculent precipitate, and with silver nitrate a white milky turbidity which lasts in a remarkable way for several weeks before a precipitate is formed.

The basic product formed in this decomposition does not appear to be ecgonine, for though dissolving readily in water, communicating to it a basic reaction, and crystallizing on evaporation in long broad needles, I did not succeed in obtaining from this base the characteristic platinum salt of ecgonine. The salt I obtained dissolved readily in water and in hot alcohol, separating from the latter solution only in translucent globular masses.

In confining myself for the present to the communication of these data I wish to add that I purpose continuing the investigation of the subject, and especially that of hygrine and cocamine.

NOTE ON THE CHEMISTRY OF STROPHANTHIN.¹

By T. R. FRASER, M.D., F.R.S.

Since former communications on the chemistry of *Strophanthus hispidus*, Professor Fraser has completed a systematic examination of various parts of the plant, more particularly of the seeds. Reserving a detailed description, a few of the results are now briefly stated. The active principle occurs most abundantly in the seeds. The body obtained by treating the alcoholic extract with ether, as described some years ago, possesses great pharmacological activity, and has the characteristics of a glucoside. In some subsequent experiments, however, although the same process was followed, a well-marked crystalline product was not always obtained, and it then became evident that the difference was due to some variation in the seeds operated on. It was also found that the body obtained by the process formerly described,

¹Abstract of Note read before Royal Society of Edinburgh, July 15, 1887. Reprinted from *Phar. Jour. and Trans.*, July 23.

whether in well-defined crystals or not, was resolvable by acetate of lead into at least two bodies, one of which is an extremely active glucoside, and the other an acid for which the name *kombic acid* is suggested. It being apparent, therefore, that the strophanthin first described is not a simple substance, attempts were made to improve the process so as to separate strophanthin in its pure state. The following is the process ultimately adopted. Starting with the product obtained in the earlier process, it is dissolved in water, tannic acid is added, and the tannate digested with recently precipitated oxide of lead. Rectified and proof spirit are now used to extract, and the extract obtained is dissolved in a small quantity of rectified spirit, and the solution precipitated by ether. The precipitate is finally dissolved in weak alcohol, and through this solution carbonic anhydride is passed for several hours, by which means lead is completely got rid of. After filtration the solution is evaporated at a low temperature and dried *in vacuo* over sulphuric acid.

Strophanthin thus obtained is imperfectly crystallized, neutral in reaction, intensely bitter, freely soluble in water, less so in rectified spirit, and nearly insoluble in ether and chloroform. It burns without residue, and contains no nitrogen. The percentage composition from the average of several closely agreeing results was found to be—

$$C=55.97, H=7.75, O=36.28,$$

which agrees fairly with the formula $C_{20}H_{34}O_{10}$.

Strong sulphuric acid produces with strophanthin a bright green color, which soon becomes greenish-yellow and brown. Sulphuric acid and potassic bichromate give a blue color in addition to the coloration caused by the acid alone. Phosphomolybdic acid produces a bluish-green color, which on addition of water becomes pure blue. With a 1 per cent. solution in water, phosphomolybdic acid causes slowly a bright bluish-green color. Tannic acid produces an abundant white precipitate, soluble both in excess of the acid and of strophanthin. The solution is not changed in appearance by acetate or subacetate of lead, platinic chloride, ferric chloride or mercuric chloride. Nearly all acid reagents cause the solution to become hazy, and it is then found that the solution contains glucose. This decomposition is also produced by sulphuretted hydrogen, especially in the heat, and for this reason it is not advisable to use sulphuretted hydrogen in any process for preparing strophanthin.

Indeed, all the mineral acids, except carbonic, and many of the

organic acids, resolve strophanthin, even in the cold, into glucose and a substance which the author names strophanthidin. A very pretty crystallization of the latter may be obtained in a few hours, when strophanthin is dissolved in a 1.5 per cent. solution of sulphuric acid. When strophanthin was decomposed at the ordinary temperature by contact for four days with 1.5 per cent. sulphuric acid, there were obtained 37.5 per cent. of strophanthidin in crystals, and about 20 per cent. of glucose, but the estimation of the latter with Fehling's solution is uncertain on account of the green coloration developed in the fluid. The strophanthidin having been removed by filtration, and the almost colorless bitter and acid liquid having been boiled for four hours, it was now found that the glucose had increased to 26.64 per cent. and that about 4.3 per cent. of an amorphous substance had been formed.

This action of acids renders it apparent that an acid, and especially a mineral acid, should not be used in the preparation of strophanthin. Thus in 1877, some years after the author's first communication on the subject, Hardy and Gallois described a process in which by using, for the extraction of the seeds, rectified spirit acidified with hydrochloric acid, they obtained a crystalline product which they believed to be strophanthin. There can be little doubt, however, that their product was strophanthidin, not only because the process employed would decompose the strophanthin into strophanthidin and glucose, but also because their crystallized product was found not to yield glucose when heated with dilute sulphuric acid. Hence they conclude that strophanthin is not a glucoside.¹ The glucosidal character of strophanthin has now been amply demonstrated from many experiments made by Professor Fraser, and by subsequent observers, especially by A. W. Gerrard.² The glucose was not only determined by Fehling's solution but also by fermentation with yeast.

Cocaine in croup.—Labric praises cocaine as the best remedy for croup. He applies a brush dipped in a five per cent. solution of cocaine to the throat for several seconds; a few drops are allowed to go down into the larynx. The operation is repeated two or three times a day, and nothing but a little black coffee is administered to the patient.—*N. E. Med. Monthly.*

¹ *Jour. de Pharm.*, xxv., 177.

² *Pharm. Jour.*, May 14, 1887. *AMER. JOUR PHAR.*, August, p. 426.

THE CHEMISTRY OF "CACUS."

By G. ARMSTRONG ATKINSON, M. D.,

Assistant to the Professor of Materia Medica, University of Edinburgh.

(From the Pharmacological Laboratory of the University).

In the *Edinburgh Medical Journal* for July, 1886,¹ I published a note on the action of cacus, cacao or small bitter apple, cacus being the Kaffir name for the fruit of the *Cucumis myriocarpus* (Cucurbitaceæ). In this paper it was shown that the fruit in small doses is purgative, in larger emetic, and if sufficient of the drug be retained after vomiting has occurred purgation also ensues. The action is somewhat like that of colocynth as far as its purgative qualities go, but it differs in that it more readily induces vomiting. The supply of the drug at the time these experiments were carried out was too small to permit of any chemical examination. Through the kindness of Mr. J. A. B. Bayley, a further supply of the fruit was forwarded me some months ago, and as from experiments with other parts of the plant I had satisfied myself that the fruit alone was active, it only was examined in detail. The fruit is a pepo, the pepoes are caducous, subglobose, and vary in size from small to very large gooseberries, which they resemble in form. When unripe they are green, when mature yellow, and are beset somewhat sparingly with short soft prickles. The South African natives use them principally as an emetic, generally in their green or yellowish-green state. The fruit does not spontaneously expel its contents. Each pepo weighs from 50 to 100, or even 130 grains, the average weight being from 70 to 80 grains. The placentæ are parietal, and bear numerous ovoid, flattened, ex-albuminous, almost white seeds, the testæ of which have a faint bitterness, apparently absorbed from the surrounding pulp. The seeds constitute about 14 or 15 per cent. by weight of the fresh fruit. The pulp is very watery and has a faint cucumber-like odor, and a very bitter taste. The rind is soft and thin, and can only be peeled off with considerable difficulty; its inner layers have the same odor and bitter taste which characterizes the pulp. The pulp and rind when dried lose weight very markedly; 1000 grains of rind and pulp from which the seeds had been removed when dried so as to be powdered, weighed only 53 grains. In drying it is necessary to use a low heat or the active principle will be decomposed. The usual purgative dose em-

¹ See AMER. JOUR. PHAR., Dec., 1886, p. 614.

ployed is one pepo, which when dried and the seeds removed would weigh about three or four grains; two pepoes are employed when emesis is desired. In either case the Kaffirs heat the fruit before using it, probably to render the pulp more watery, as they squirt the contents of the pepoes into their mouths and swallow the expelled material. A considerable quantity of colloid material is in the pulp, and doubtless assists the action of the drug by retarding absorption of the active principle, for this when isolated, as described below, acted less constantly than the fresh pulp. No tannic acid is found in the fruit, but a considerable quantity of chlorophyll is present. The active principle, as mentioned above, is injured by a high temperature, as by that of boiling water; this, together with the fact that few reagents precipitate it, render its isolation somewhat difficult by any of the ordinary processes, which were all tried with varying and inconstant results. The method which gave a satisfactory yield, quantitatively and qualitatively, was very simple. The seeds were removed from the pepoes, which were cut up as finely as possible and then dried at a low temperature in an air-bath. The product was powdered and exhausted with rectified spirit. The spirituous solution was evaporated almost to dryness, as small an amount of heat as possible being employed, and the residue dissolved in a little water to which freshly precipitated oxide of lead was added to decolorize the solution. This required about twenty-four hours with frequent agitation. The mixture was then filtered, and the almost colorless filtrate exhausted with ether without further evaporation. The ether extracted the active principle, and when decanted was quite colorless, but possessed a very bitter taste. After slow evaporation of the ether a very pale yellow body was left, which became resinoid in appearance and brittle, being easily reduced to a pale yellow powder, intensely bitter, and producing the pharmacological actions of the fruit, but not, as previously stated, being so constant in action. The yield was very small; it was quite amorphous, no method of treatment yielding any trace of crystallization. The body so extracted dissolves readily in water; it is soluble in alcohol of all strengths, but less readily in very strong than in weaker alcohol. In ether it dissolves, but not very readily, although sufficiently to allow extraction by its means. In chloroform it is only slightly soluble, and less so in petroleum spirit. When heated on the platinum foil it burns readily with little charring, and leaves no residue. Strong sulphuric acid dis-

solves it with the production of a brownish-red color, and Fröhde's reagent produces the same color reaction. Nitric, hydrochloric and acetic acids give no distinct color reactions. The watery solution is neutral to litmus paper. Tannic acid produces a bulky yellow precipitate soluble in excess of the reagent. Phosphomolybdic acid, solution of iodine in iodide of potassium, platinic chloride, iodide of bismuth and potassium, iodide of potassium and mercury, picric acid, acetate and basic acetate of lead, ferric chloride, nitrate of silver and mercuric chloride are without visible effect. Solutions of alkalies turned the practically colorless watery solution yellow, and the bitterness entirely disappears; if digested some time with dilute acids a similar coloration and loss of bitterness occurs, and a similar result is obtained on merely boiling for some little time. In all cases a yellowish flocculent precipitate separates out which is tasteless, and apparently without action. The watery solution reduces Fehling's solution, but does not ferment with yeast, nor does any of the solutions which result from treatment of the watery solution with an alkali, with an acid, or with heat alone. No other active body was detected in the fruit. The active substance is thus seen to be apparently a neutral principle, which is not a glucoside, and in accordance with the usual nomenclature might be termed "myriocarpin."—*Phar. Jour. and Trans.*, July 2, 1887, p. 1.

USEFUL PREPARATIONS OF IODOL.

Dr. Wolfenden, of London, mentions in the *Practitioner* for May, 1887, the following as preparations which he has found useful:

1. *Powder of iodol*.—The pure powder may be used. There is no need to mix it with starch or sugar, etc., since, being fine, it is readily dusted over a raw surface, or insufflated into the throat. Possessing no toxic power, it is of more importance to cover the diseased surface than to measure the dose. For all laryngeal, pharyngeal, and most nasal and oral conditions this is, perhaps, the most generally useful application.

2. *A solution in alcohol and glycerin*.—This was Mazzoni's original application: iodol, one part; alcohol, sixteen parts; glycerin, thirty-four parts. This forms a good application by means of the brush, or may be used as a very coarse spray.

3. *Iodol, 1 drachm; ether, 1 ounce*.—This forms a clear brown

solution, useful for application either by the spray or brush. The ether quickly evaporating leaves the powder *in situ*. It is useful for naso-pharyngeal atrophic conditions.

4. *Iodol*, 1 drachm; *glycerin*, 1 drachm; *vaseline*, 7 drachms.—This is a modification of one of Rumbold's sprays. It is a very soothing application for pharyngeal conditions. It requires to be warmed before using.

5. *Iodol pastilles*.—*Iodol*, 1 grain; *glycerin*, 1 minim; *glycogelatin*, 18 grains. These are very useful for chronic pharyngeal conditions, and are much preferable to iodoform pastilles.

6. *Iodol bougies*, containing $\frac{1}{2}$ a grain iodol in each. These are made for use in diseased nasal conditions.

7. *Iodol wool*, 10 per cent., for tampons, etc.

8. *Iodol gauze* for dressings.—*Medical News*, July 16.

BLUE IODIDE OF STARCH.¹

By F. MYLIUS.

The analogy between iodide of starch and iodocholic acid, is shown by the following facts: (1) Iodine solutions which color starch contain either hydriodic acid or one of its salts; (2) the presence of substances, such as chlorine, which decompose hydriodic acid, prevents the formation of iodide of starch; (3) silver solutions decolorize solution of iodide of starch—the color is restored by adding potassium or hydrogen iodide; (4) an aqueous solution of iodine cannot color starch blue; the blue color appears at once when a trace of hydriodic acid or potassium iodide is added.

When starch is added to a solution of iodine and hydriodic acid containing sulphuric acid, iodide of starch separates: the amount of iodine and hydriodic acid which has been absorbed by the starch can be readily determined by titration. The results of several experiments show that the proportion of iodine absorbed to that of the hydriodic acid is 4: 1, and it is probable that the resulting compound has the formula $(C_{24}H_{40}O_{20}I)_4, HI$. From this, the author concludes that the formula of starch is $C_{24}H_{40}O_{20}$, which is that ascribed to it by Pfeiffer and Tollens (1882).

Iodide of starch dried in a vacuum appears to be anhydrous. The

¹ Ber., xx., 688-695; reprinted from Jour. Chem. Soc., June, p. 568.

barium compound was analyzed, and has probably the composition expressed by the formula $(C_{24}H_{40}O_5I)_3, BaI_2$. The potassium and sodium compounds are soluble, the barium and zinc compounds are insoluble.

ON A NEW TYPE OF BLUE IODINE COMPOUNDS.¹

By F. MYLIUS.

Iodocholic acid, $(C_{20}H_{40}O_5I)_4, KI + xH_2O$, is obtained by adding a concentrated aqueous solution of 1 gm. of potassium iodide to a solution of 2 gm. of cholic acid and 0.8 gm. of iodine in 40 c.c. of alcohol. The mixture is gradually diluted with water until the blue substance separates. This is then collected and washed with water. It forms a matted mass of bronze-like lustre. When suspended in water (500 c.c.), an indigo-blue liquid is produced. When the latter is heated, it becomes yellow and cholic acid separates; when a few drops of the blue liquid are poured into water, the blue color disappears in a few moments, and the solution is found to contain free iodine. The substance is therefore decomposed by excessive dilution. Sulphurous acid decolorizes the liquid with separation of cholic acid. The solution is also decolorized by adding a few drops of soda solution, with formation of sodium cholate, iodide, and iodate; on adding hydrochloric acid, the blue compound is re-formed. When iodocholic acid is dried in a vacuum, a dark, lustrous, crystalline powder is obtained which dissolves in ether containing alcohol, yielding a yellow solution; this, when evaporated, leaves a yellow, amorphous substance which is anhydrous iodocholic acid. The latter becomes blue in presence of water.

The compound $(C_{24}H_{40}O_5I)_4, HI$ is prepared by adding a small quantity of hydriodic acid to the brown solution of cholic acid and iodine. The liquid at once becomes blue. The compound is isolated in a manner similar to the potassium compound which it completely resembles. The barium compound, $(C_{24}H_{40}O_5I)_3BaI_2$, and the zinc, cadmium, and ammonium compounds are obtained by using corresponding iodides in the place as potassium or hydrogen iodides.

Salol in Sciatica.—Dr. v. Aschenbach, of Corfu, reports in the *Fortschritt der Med.* that suffering from sciatica, for which all known remedies had been tried in vain, he, in the evening, took a dose of half a gram of salol, and at night one gram, after which he fell asleep and remained perfectly free from his pains.—*Am. Pract. and News.*

¹ *Ber.*, xx., 683-688; reprinted from *Jour. Chem. Soc.*, June, p. 606.

ON THE ESTIMATION OF GLYCERIN IN FATS.¹

BY OTTO HEHNER.

In the publication of the principle upon which the method to be described in the following paper is based, I have quite recently been forestalled by L. Legler (*Analyst*, January 1887), and I, therefore, cannot lay any claim to originality. But as I operate in a manner quite different from that adopted by Legler—his process being only applicable to somewhat concentrated glycerin liquor, whilst I am enabled to determine the glycerin in even the most dilute solutions—I venture to lay a description of it, and of results obtained, before the members of the Society. A portion of my investigation is, furthermore, of general importance, and concerns all methods of glycerin estimation, since it treats of the question of the volatility of glycerin with aqueous vapor.

Glycerin decomposes, on treatment with bichromate of potassium and sulphuric acid, into carbonic acid and water. Legler weighs the carbonic acid, or rather the loss of carbonic acid, in an ordinary carbonic acid apparatus. Messrs. Cross and Bevan (*Chemical News*, Vol. 56, p. 2), measure the volume of the gas evolved.

It is evident that both these modifications require limited bulks of fluid, and, therefore, exclude the estimation of glycerin in very dilute solutions, such as are obtained in the analysis of fat—the washings, in fact, of the insoluble fatty acids.

The process which I have described (*Analyst*, XII, February) for the estimation of methyl in the presence of ethyl-alcohol, and which consists in the measurement of the quantity of bichromate reduced, is, as I hope to show, particularly suitable for the analysis of such washings.

One part of glycerin requires, for complete oxidation, 7.486 parts of potassium bichromate.

Solutions required.—(1.) Bichromate, containing in each litre about 80 grammes of bichromate and 150 c.c. of strong sulphuric acid. The exact value of the solution should be ascertained by titration with solutions of known weights of iron wire.

2. Ferrous and ammonia sulphate containing about 120 grms. per litre.

3. Bichromate ten times more dilute than the above.

¹Read at the meeting of Public Analysts, February 9th, 1887; reprinted from *The Analyst*, xii. 44.

The ferrous solution is exactly standardized upon the chromate solution, and the glycerin value of the chromate (contents of $K_2Cr_2O_7$ divided by 7.486) is calculated.

The chromate solution used in my experiments standardized as follows:—

2.8412 grms. iron-wire = 2.8327 pure iron, required 33.94 c.c. bichrome. 1 c.c. = .07333 bichrome, or .009796 glycerin.

2.7078 grms. iron-wire = 2.6997 iron used 32.3 c.c. bichrome. 1 c.c. = .07344 bichrome, or .009810 glycerin. Average 1 c.c. bichrome = .07338 grms. bichrome or .009803 glycerin.

Test experiments.—Glycerin, specific gravity 1.2572, containing according to Lenz's tables, 95.55 per cent. of pure anhydrous glycerin—was taken, a solution of 12.5798 grms. per litre, corresponding to 12.0200 grms. of pure glycerin, being used. 25 c.c. of this solution, equal to .3005 glycerin were taken in each of the following experiments.

25 c.c. heated with 40 c.c. bichromate, without further dilution for two hours to near the boiling point: 30.41 c.c. bichromate were consumed, corresponding to .2981 grms. glycerin, or 99.2 per cent. of the glycerin taken.

25 c.c., heated with bichrome and 25 c.c. strong hydrochloric acid for one hour, consumed 31.16 c.c. bichrome, equal to .30546 grms. or 101.6 per cent.

25 c.c., diluted with 500 c.c. of distilled water, reduced in three hours 23.93 c.c. bichromate, equal to .23458 grms. or 78.1 per cent. of glycerin.

The same quantity, diluted with 500 c.c. of water, plus 25 c.c. strong hydrochloric acid, heated for one hour, reduced 22.3 c.c. bichrome, indicating .2186 grms., or 72.7 per cent.

25 c.c., diluted with 500 c.c. of water, plus 25 c.c. sulphuric acid, consumed in one hour 29.34 c.c. bichrome, = .2876 grms., or 95.7 per cent. of the glycerin taken.

Conditions the same as in the previous experiment, only the heating continued for two hours. Bichromate consumed 29.89 c.c. = .2930 grms., or 97.5 per cent. of glycerin taken.

25 c.c. were diluted to about 300 c.c., the solution evaporated to about one half upon the water-bath, and then heated with 25 c.c. strong sulphuric acid and chromate. After two hours 30.54 c.c. bichromate were found to be reduced, corresponding to .2994 grms. or 99.6 per cent. of glycerin.

In a similar experiment the diluted solution was vigorously boiled down over the naked flame to about one half (the basin being, of course, covered with a dock glass to prevent loss by spurting), and heated for two hours with sulphuric acid and bichromate. Found .2961 grms. or 98.5 per cent. of the glycerin taken.

In a precisely analogous experiment 10 c.c. of strong alcohol were added to the water, before boiling, over the naked flame. After two hours 30.33 c.c. of chromate were reduced, equal to .2973 grms. or 98.9 per cent. of glycerin found.

The alcohol experiment repeated, but the fluid concentrated on the water bath, an amount of bichromate was reduced corresponding to 107.6 per cent. of glycerin. An odor of aldehyde was perceptible during the oxidation.

Deductions.—From these test experiments the following conclusions can be drawn :

1. In a fairly concentrated solution glycerin is quantitatively oxidized by acid bichromate ;
2. In a very dilute solution the oxidation is not complete even after many hours' heating ;
3. The addition of hydrochloric acid does not materially help oxidation ;
4. In solutions containing about 10 per cent. of strong sulphuric acid the oxidation is complete after two hours, even in exceedingly dilute solutions (6 glycerin per 1000 of fluid) ;
5. *From such dilute solutions, glycerin does not, as is commonly assumed, volatilize on concentrating the fluid, be it on the water-bath or over the naked flame ;*
6. Should alcohol be present it is completely volatilized by vigorously boiling the fluid down to one half, but not on the water-bath.

The non-volatility of glycerin from dilute solutions may further be readily demonstrated by distilling from a large retort 500 c.c. of water, containing about .3 grms. of glycerin, catching the first 250 c.c. of the distillate. This distillate does not, even on heating, decolorize more than a few drops of a dilute permanganate solution, such as is used in water analysis.

Method for estimating glycerin in fats.—Saponify about 3 grms. of the fat with alcoholic potash ; do not drive off all the alcohol, lest glycerin should volatilize from the concentrated solution, but dilute

to about 200 c.c.; decompose the soap with dilute sulphuric acid, filter off, and estimate insoluble fatty acids as usual. Vigorously boil the filtrate and washings (amounting to about 500 c.c.) in a covered beaker or basin, down to one half, add 25 c.c. strong sulphuric acid (suitably diluted) and 50 c.c. standard bichromate. Heat to near boiling for two hours, and titrate back the excess of bichromate with excess of ferrous sulphate, and ultimately the latter with decichromate using ferrieyanide as indicator. Calculate from the chromate consumed the amount and percentage of glycerin.

Finally, I will add a few results obtained on applying the method to a few fats:

Olive oil.....	10.26 per cent. glycerin.
Cod liver oil.....	9.87 per cent.
Linseed oil.....	10.24 and 10.20 per cent.
Butterine.....	10.01 per cent.
Butter.....	12.40 and 11.96 per cent.

Of course, I am fully aware that other substances, should they be present, might reduce bichromate as well as the glycerin does. The analogous objection applies to Dr. Muter's and Mr. Fox's processes; I have, however, convinced myself that soluble fatty acids, like butyric, do not act upon bichromate, nor do fatty acids of higher molecular value.

The method may not be theoretically perfect, but it may commend itself for its simplicity and rapidity in cases of fluids which cannot contain anything but glycerin and soluble fatty acids.

QUANTITATIVE ESTIMATION OF GLYCEROL.¹

By R. DIEZ.

The methods hitherto employed for the estimation of glycerol in wine and beer consist in dissolving it out usually by alcohol and ether from a mixture of the beverage with chalk, and finally weighing the glycerol. Neubauer and Borgmann (1879) found that the glycerol so obtained contained 2 per cent. of mineral constituents and 0.4 per cent. of nitrogen. Champion and Pellet (1873) devised a method in which

¹Zeit. physiol. Chem., xi., 472-484. Reprinted from Jour. Chem. Soc., August, 1887, p. 750.

the glycerol was obtained as nitroglycerol, and weighed in this form, but this and other methods are also liable to error. The present method is one in which the compounds of glycerol with benzoyl are weighed. There are three benzoates of glycerol, according as to whether one, two, or three atoms of the hydrogen of the latter are replaced by the group $C_7H_5O_2$. The following gives the method of procedure:—Glycerol was diluted to a known extent with water (0.1 gm. in 10 or 20 c.c.); 5 c.c. of benzoic chloride and 35 c.c. of sodium hydroxide added; this mixture was cooled and shaken for ten or fifteen minutes. The benzoyl compound which separated was collected on a weighed filter, washed with water, dried at 100° , and weighed. A mean of eight estimations gave the amount of the compound as 0.385 gm. In a second series of four estimations, the number obtained was rather higher, the mean being 0.395 gm.; in these cases the alkaline filtrate was shaken a second time with benzoic chloride and sodium hydroxide; the second filtrate contained hardly a trace of glycerol. These numbers formed a basis for the subsequent analyses, and showed that the compound formed in this way was chiefly the tri-benzoate; theoretically the amount of that compound for 0.1 gm. of glycerol would be 0.439 gm. Tables of the amount of glycerol in various forms of beer and wine, estimated by this method, are given, the numbers obtained being somewhat less than those given by Borgmann. The method has the following advantages: The substance weighed is solid and not hygroscopic, and admixture with inorganic and nitrogenous substances is avoided.

BARIUM PHOSPHATES—THEIR APPLICATION IN ACIDIMETRY.¹

BY A. VILLIERS.

Phosphoric acid is bibasic when phenolphthaleïn is used as an indicator, and can be titrated with a solution of potassium or barium hydroxides. Other free acids, such as hydrochloric, sulphuric, acetic, can be titrated in presence of phosphoric acid by means of potassium hydroxide, but not with baryta.

Joly has already shown that when barium chloride is added to diso-

¹ *Compt. rend.*, civ., 1104–1106. Reprinted from *Jour. Chem. Soc.*, August, p. 701.

dium phosphate the solution becomes acid, but the author gives a somewhat different explanation of the phenomenon.

If the acid solution produced by mixing solutions of disodium phosphate and barium chloride is mixed with phenolphthaleïn, and then with baryta solution, the addition of the first few drops of the alkali causes a somewhat rapid appearance of the red color, but after five or six minutes this disappears, and a somewhat considerable quantity of baryta is necessary for the production of a persistent coloration. The volume of baryta solution required to produce the second end reaction varies with the proportions of barium chloride and disodium phosphate.

In presence of a large excess of disodium phosphate, the precipitate after washing and drying at 120–130° is constant in composition; it is barium sodium phosphate, BaNaPO_4 . Its formation takes place in two stages, the first of which is represented by the equation $\text{Na}_2\text{HPO}_4 + \text{BaCl}_2 = \text{BaHPO}_4 + 2\text{NaCl}$. The acidity of the liquid at this stage is due to the formation of a small quantity of tribarium phosphate, and the consequent liberation of free acid. In the second stage, the barium hydroxide acts on the barium hydrogen phosphate in presence of sodium chloride, with formation of barium chloride, water, and barium sodium phosphate.

Barium sodium phosphate has previously been obtained in hydrated crystals by Schulten (1883) by the action of sodium phosphate on sodium silicate and barium hydroxide. It can also be prepared in an amorphous and less pure condition by the action of barium hydroxide on a solution of disodium phosphate, and in small quantity by adding barium chloride to a solution of trisodium phosphate, but it can only be obtained in a state of purity by the method described above.

Tribarium phosphate is obtained only by pouring sodium phosphate into a solution containing a large excess of baryta.

Barium hydrogen phosphate which has been precipitated for some time, and has become crystalline, is not readily converted into the double phosphate, a proof of the alteration which the precipitate undergoes in course of time.

From these facts it is evident that free acids cannot be accurately titrated by means of baryta in presence of disodium phosphate, and this is true also of the titration of phosphoric acid in presence of alkaline salts. Accurate estimations can, however, be made in either case by means of potassium hydroxide solution.

PREPARATIONS OF DIGITALIS.

Why are preparations of *digitalis* frequently inert?—Kobert, of Dorpat, answers this question as follows in an article reporting a number of experiments upon *digitalis*:¹ "What form of *digitalis* shall be employed? Most commonly preferred is the infusion. This naturally contains only those substances soluble in water. Of the three important active principles *digitalein*, a drug which produces dilatation of the vessels of the kidneys, is soluble in alcohol, it is contained in the tincture and alcoholic extract. The other constituents, *digitoxin* and *digitalin*, are also soluble in alcohol; in alcoholic preparations, as well as in the leaves themselves, we obtain the three important active principles. In fluid extracts *digitoxin* is precipitated as an insoluble powder. *Acetum digitalis* (vinegar of *digitalis*) approaches the infusion most closely in regard to its contents. It is very desirable that fresh, well-dried leaves be used. When the leaves are imperfectly dried, a species of fermentation may occur which may decompose the three essential components of the drug, for *digitalin* and *digitalein* are, like all glucosides, decomposable through foreign matter and fermentation. *Digitoxin* is, however, not a glucoside, but decomposes as easily and under the same circumstances as the others. The result of the decomposition of *digitalis* is not a substance producing the desired effects upon the heart, but a resin, *digitaliresin* (from *digitalein* and *digitalin*) and *toxiresin* (from *digitoxin*). The effect of these bodies is a violent irritation of the convulsive centres of the brain; severe convulsions may also occur, as in poisoning with *picrotoxin* or *cicuta virosa*. Whenever the usual effects of *digitalis* are wanting, or instead cramps occur, we are safe in thinking that the preparation used was a poor one. The decomposition of *digitalis* may occur not only in the leaves, but also in infusions and solutions of *digitalin* and *digitalein*. As Tardieu says, 'The pure *digitalein* when suspended in water or dissolved, undergoes decomposition in a short time, whereby the bitter taste is altered, and, as an indication of a radical change in the constitution of the drug, gases form.' Among my patients I have very often seen decomposition in preparations of *digitalis* which had stood two days in a room. This happens from the mixing of *digitalis* tincture with syrup or watery solution. The practice prevalent in America of not preparing the drug from the leaves when desired, but of using a concentrated infusion, explains the frequent disappointment in its use."

¹ *Therap. Gazette*, June 15; *Med. News*, July 23, 1887.

NATURAL EUCALYPTATED HONEY.¹

Dr. Thomas Caraman, in a paper read before the Académie de Médecine, January 25th, 1887 (*Le Progrès Médical*, April 16th, 1887), says that on May 25th, 1884, M. D. Guilmeth, the French explorer and naturalist, then in Tasmania, in the centre of Australia, came upon a large opening traversed by a shallow stream of water, upon the banks of which grew eucalyptus trees of from 260 to 390 feet in height. He noticed in the topmost branches of one of these trees an odd-looking dumpy hut with a dome-like roof, whose brownish exterior recalled the mud-coverings of our own country. It was 3 P. M., and the thermometer stood at 64° F. in the shade. Unable to make out what it was, and it being impossible to climb the tree, he determined to wait and watch. About 4.30, he heard a continued far off buzzing sound and saw an immense swarm of black insects, smaller than our bees, flying around an opening in the hive. These bees were of a kind unknown to him. He had seen the Australians when sick sweeten their beverages with a kind of honey which had not attracted his attention. Consequently, the discovery awakened his interest, and he set two carpenters to sawing down the tree, which was finished the next day. The tree was nearly twenty-three feet in diameter. When the tree fell, M. Guilmeth and some of his attendants, having covered their faces and hands, advanced towards the hive, beating upon the tambourines of the country. The queen soon flew away followed by most of her subjects. M. Guilmeth examined the honey, and found that it was charged with the active principles of the eucalyptus. He collected 3,500 kilogrammes of honey. He has cut down trees in which were hives or nests weighing 6,000 kilogrammes and yielding 5,000 kilogrammes of honey.

We have not been able to find a description of this black bee. He calls it the *Apis nigra-mellifica*. It is black and small; its tongue or trumpet appears to be much more developed than that of our working bees of France and Algiers. He has attempted, without success, to domesticate it in Tasmania. It has also been attempted to make the bees of Algiers swarm in the neighborhood of eucalyptus plantations, and by this rational means to obtain a particular honey. The native bees, however, when they have access only to the flowers and leaves of the eucalyptus, die one by one.

¹Translated by R. M. Slaughter, M. D. Reprinted from *Virginia Medical Monthly*, July.

When passed through a medium sieve at a temperature of 68° F., the honey presents the appearance of a rather transparent, syrupy, thick, homogeneous liquid of a deep orange color. Its odor, *sui generis*, reveals immediately its nature and special composition—plainly that of the eucalyptus. It is very soluble in water, milk, and the native wines, but much less so in alcohol. Its fermentation is very difficult on account of the large proportion of sugar, about 612 grammes to the kilogramme.

It contains to the kilogramme, reducent sugar (principally levulose), 611.6 gms., water 215.6 gms., active principles (eucalyptol, eucalyptene, terpene, cymol, odorous, resinous and coloring matters), 171 gms. Its density is 1.44.

A striking fact is the enormous quantity of absolutely pure sugar, and the contained active principles, giving the honey a very considerable therapeutic value. The eucalyptol as extracted from this honey is a white, slightly amber-colored liquid, and almost opaque. The other principles form a grey-brown, opaque mass with a special odor, which differs from that of the eucalyptol. An attempt to make an artificial honey by combining the principles in the same proportion, as indicated by the analysis, with the honey of Narbonne failed entirely.

In experiments upon animals, the honey produced a marked and quite lasting reduction of temperature. Upon man in good health, it produces the following effects: A tablespoonful taken in a little hot water or milk makes a delightful drink; a few minutes after taking it an agreeable glow pervades the whole system. In half an hour a portion of the active principles begin to be eliminated by the bronchi and larynx, and the voice becomes clearer and more sonorous, and the breath perfumed. It seems, also, that the lungs are more elastic, more supple. If the honey is continued in tablespoonful doses four times daily for a week, the weight increases considerably, as also do the powers of endurance (lung power). At the same time, there is a slight diuresis with augmentation in amount of urea, with a pronounced odor of the urine like that of the cassia rather than of the violet.

Physiological action.—1st. The natural eucalyptated honey is a valuable aliment, containing as it does 612 gms. per 1,000 of pure sugar, and may replace cod-liver oil in chronic bronchial trouble, and in scrofulous and strumous troubles. 2nd. It is anti-catarrhal and a

cardiac sedative, having an action upon the heart like digitalis. Upon the bronchial mucous membrane it acts as a moderator of the secretions and as an anti-proliferator (pardon the word) of the epithelium cells. 3rd. It is a febrifuge, and, 4th, an anti-putrid parasiticide. 5th. It is anti-blennorrhagic, the active principles eliminated by the urine, acting more powerfully than copaiba and oil of sandal-wood.

It may be taken in water or milk, or spread upon bread. Locally he has used it as an injection, dissolved in the decoction of dulcamara, with excellent results.

VARIETIES.

Belladonna against iodism.—M. Aubert, of Lyons (*F. Plan. Lyon*, 120, p. 14), finds that the coryza and other troubles which are caused by the administration of iodide of potassium to those who are intolerant of it, may be prevented by the simultaneous exhibition of belladonna. He records a case in which the iodide, both in small and large doses, caused the usual symptoms of iodism, and after long-continued administration of the drug tolerance was in no way established. As soon as "pilules of belladonna" were given with the iodide, the unpleasant effects were no longer felt. Aubert affirms that the tolerance sometimes continues when the belladonna is omitted.—*Med. Chronicle*.

Cocaine as an antidote to strychnine.—Bignon ("Genio Med. quir.") finds, as the result of experiments on dogs, that hypodermic injections of cocaine, kept up until the strychnine has been eliminated, prevent a fatal result in cases where the dose of strychnine administered is not excessive, and retard it when large doses are used.—*N. Y. Med. Jour.*, Aug. 18.

Influence of infused beverages on digestion.—Dr. James W. Fraser has studied experimentally the action of our common beverages on gastric and intestinal digestion. (*Jour. Anat. and Physiol.*) These are his conclusions: (1) It is better not to eat most albuminoid food-stuffs at the same time as infused beverages are taken, for it has been shown that their digestion will in most cases be retarded, though there are possibly exceptions. Absorption may be rendered more rapid, but there is a loss of nutritive substance. On the other hand, the digestion of starchy food appears to be assisted by tea and coffee; and gluten, the albuminoid of flour is the principle least retarded in digestion by tea, and it only comes third with cacao, while coffee has a much greater retarding action on it. From this it appears that bread is the natural accompaniment of tea and cacao when used as the beverage at a meal. Perhaps the action of coffee is the reason why it is usually drunk alone or at breakfast—a meal which consists much of meat, and of meats (eggs and salt meats) which are not much retarded in digestion by coffee. (2) Eggs are the best form of animal food to be taken along with infused beverages. Apparently they are the best lightly boiled if tea,

hard-boiled if coffee or cacao, is the beverage. (3) The casein of the milk and cream taken with the beverage is probably absorbed in a large degree from the stomach. (4) The butter used with bread undergoes digestion more slowly in presence of tea, but more quickly in presence of coffee or cacao; that is, if the fats of butter are influenced in a similar way to olein. (5) The use of coffee or cacao as excipients for cod-liver oil, etc., appears not only to depend on their pronounced tastes, but also on their action in assisting the digestion of fats.—*Med. and Surg. Rep.*

Hand-grenades.—Some excellent suggestions concerning these high-priced appliances for extinguishing incipient fires are quoted in *Building from Chamber's Journal*. "Though undoubtedly the saline solution with which they are filled is somewhat more efficient for the purpose for which they are intended than pure water, there is no reason why a householder should not manufacture his own hand-grenades, and, by so doing, save an unnecessary outlay of money. The hand-grenade solution recommended is a mixture of 19.47 parts common salt, 8.88 parts salammoniac, and 71.66 parts water. It is entirely unnecessary to compound the mixture with any such exactness, as a rough approximation to the proportions given will give practically the same results. Having prepared this solution, the next thing is, to provide suitable receptacles for it, and place them about the house. Ordinary quart bottles are made of too heavy glass, and do not readily break when thrown at a fire; neither are they of suitable shape for the purpose. The glass flasks used by chemists make excellent hand-grenades, for they are of thin glass, and hold just about the right amount of fluid. The principal objection to them is their cost, but the combined cost of such flasks and the solution for filling them is much below the current price of hand-grenades. There are certain kinds of wine-bottles also which might be used advantageously, as the only necessary feature is thinness of glass, so that the grenade will surely break when thrown at a fire. The bottle or flask should, of course, be stoppered; and it were well to cover the corks with sealing-wax, so as to prevent any loss by evaporation."

PHARMACEUTICAL COLLEGES.

The Department of Pharmacy, University of Kansas, had its second anniversary, June 6th, when addresses were delivered by several students, by Mr. Rob. J. Brown, and by Professor Sayre, the discourse of the latter being "On Future Study." The graduating class in this department numbered fifteen.

The School of Pharmacy of the University of Michigan held its nineteenth annual commencement, in connection with the semi-centennial celebration of the University, on June 29th and 30th. The degree of Master of Pharmacy was conferred upon one, and that of Pharmaceutical Chemist upon twenty-nine students. The Alumni Association elected Prof. A. B. Stevens, Ann Arbor, president; T. A. Reyer, Detroit, secretary, and A. C. Schumacher, Ann Arbor, treasurer.

The Chicago College of Pharmacy held its twenty-third commencement at the close of the summer session in Attfield Hall of the college building, August 4th, when the degree of Graduate in Pharmacy was conferred upon twelve gentlemen and two ladies. Addresses were delivered by Mr. G. P. Engelhard, Prof. Garrison and W. M. Jewell, Ph.G. The senior prize was awarded by Prof. Bastin to A. Emil Hiss, and the junior prize to E. A. Sayre.

PROCEEDINGS OF STATE PHARMACEUTICAL ASSOCIATIONS FOR 1887.

Alabama, pp. 27.—See July number p. 369. Next meeting in Selma, May 8, 1888; Geo. A. Cunningham, Local Secretary.

Connecticut, pp. 112.—See June number p. 315. Next meeting in Willimantic, February 7, 1888; F. M. Wilson, Local Secretary.

Louisiana, pp. 75.—See June number p. 315. Next meeting in New Orleans, April 11, 1888; Mrs. E. Rudolf, Corresponding Secretary.

Nebraska, pp. 127.—See June number p. 316. Next meeting in Lincoln, May 8, 1888; W. C. Lane, Local Secretary.

New York, pp. 250.—The meeting was held at the Thousand-Island Park, June 21-23. Committee reports on adulterations and unofficial formulas were read; also the following papers: "Parts by Measure," by C. W. Holmes; "Syrup of Hydriodic Acid," by D. C. Cameron; "Upright Condensers," by L. F. Stevens; "The Action of Boric Acid on Microbes," by Dr. R. G. Eccles; "Ice Water vs. Distilled Water, for Pharmaceutical Preparations," Dr. Eccles; "Extract of Vanilla" and "Relative Business Relations," by C. W. Holmes. The officers are: A. Sager, Cortland, president; J. H. Smith, R. E. Phillips and W. Whitney, vice-presidents; Clay W. Holmes, Elmira, secretary; C. H. Butler, Oswego, treasurer. The next meeting will be held in Catskill, June 19, 1888; G. A. Dykeman, Local Secretary.

Virginia. Pp. 103. See July number, p. 376. Next meeting in Danville, May 1st, 1888; F. Clark, Local Secretary.

EDITORIAL DEPARTMENT.

Pharmaceutical Examining Board of Pennsylvania.—A circular letter has been issued to all retail druggists and apothecaries, proprietors as well as assistants, with the notification to register in conformity with the law within ninety days from the date of the official notice, August 20. The time for registration without examination will expire November 18, and the Board has no power to extend it.

The Board will meet in Pittsburg, September 28, when the first examination will probably be held. Applications are to be directed to the secretary, H. B. Cochran, Lancaster.

Remedy for rhus poisoning.—The following correspondence is contained in *Popular Science News* for June :

"I have always been extremely susceptible to the poison of poison-ivy and oak so as to give me great annoyance, unless it is immediately checked on its first appearance. This common washing-soda accomplishes for me, if properly applied. I make the application by saturating a slice of loaf-bread with water, then cover one surface with soda, and apply to the eruption, the soda next the flesh. When the bread is dried by the animal heat, I drop water on the outer side so as to keep it thoroughly moistened, and dissolve the soda crystals in contact with the skin. This, you will perceive, is merely a bread poultice; the bread being a vehicle through whose moisture the soda reaches the humor. I find that the washing or bathing with soda water, even continuously will not suffice with me. My skin requires the heat and moisture of the bread in order for the soda to act on and neutralize the poison. I rarely have need to retain this soda poultice for more than thirty minutes on any affected part. No pain ensues. Formerly I suffered often for weeks, as the poison would spread all over my body. Now thirty minutes measure the duration of its exhibition."

We have tried this remedy in the case of a child with an eruption five days old, and of such severeness that the fingers could not be bent. The sodium carbonate was scraped upon the soaked bread and applied for half an hour, when the pain had subsided and all the joints could be freely used. Another application was made the next morning, and this terminated the attack. In another case, where the eruption had appeared in the face, the remedy acted with equal promptness.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Practical Urine Testing.—A Guide to Office and Bedside Urine Analysis, for Physicians and Students. By Chas. Godwin Jennings, M.D., Professor of Chemistry and of Diseases of Children, Detroit College of Medicine, etc., Detroit. D. O. Haynes & Co., 1887. 12 mo. pp. 124.

The first part of this little work treats of the physical characters, the normal constituents and the abnormal constituents of urine, the causes of change or variation by physiological and pathological conditions being briefly pointed out. The second part is divided into five chapters on qualitative analysis, quantitative analysis, microscopical examination, analysis of calculi, apparatus and reagents. While in part 1 the relative utility of the various tests and methods of testing is briefly discussed, part 2 gives the practical application of the most reliable and convenient tests in systematic order, without relating to physiological or pathological influences. A portion of the eighteen cuts illustrate certain apparatus, while the larger number show the appearance under the microscope of urinary sediments and of the results obtained by the application of tests.

In all cases examined by us, we have found the directions clear, concise, and reliable, and we cheerfully recommend the work as a valuable outline of urinalysis, adapted to the needs of the physician as well as of the pharmacist, who is frequently called upon for the examination of urine and urinary deposits.

What to do in Cases of Poisoning.—By Wm. Murrell, M.D., F.R.C.P. Lecturer on Pharmacology and Therapeutics in the Westminster Hospital, etc. First American from the fifth English edition. Edited by Frank Woodbury, M.D., Fellow of College of Physicians of Philadelphia, etc. Published by the Medical Register Co., Philadelphia, 1887. 12 mo, pp. 158.

The general diagnosis of cases of poisoning, based upon the most striking symptoms, opens the introductory portion of this little volume, which also enumerates the poisonous ingredients known or supposed to be present in a number of popular nostrums. A source of possible poisoning is pointed out from the slow solubility of certain pill coatings; if pills containing active ingredients have been taken repeatedly, the coating of several may be dissolved under specially favorable circumstances, and thus the effects of an unusually large dose of the poison may be produced. The antidote cases of various manufacturers are described, and the different emetics and other means of treatment, and subjects relating to poisoning, are briefly discussed in the introductory part.

The greater portion of the book is devoted to the poisons, which are arranged in alphabetical order, and are usually considered under the following headings: How taken, symptoms, diagnosis, fatal dose and treatment. All these points are concisely discussed with the view of practical application in cases of emergency, greater prominence being, as a matter of course, given to those poisons most commonly used.

The work is thoroughly practical, and will doubtless be as well appreciated in this country as it has been in Great Britain, since the American editor has rendered the nomenclature and formulas in harmony with our pharmacopoeia, and has made some other changes intended to increase its usefulness on this side of the Atlantic.

A Compend of Pharmacy.—By F. E. Stewart, M.D., Ph.G., etc., Philadelphia. P. Blakiston, Son & Co.

We again refer to the new edition of this work for the purpose of stating that it may be obtained interleaved, as we suggested on p. 379 of our July number, so as to serve as a convenient note-book. For this purpose it would be still further improved, we think, by the omission in the first two parts of the questions preceding the text proper.

Twenty-third Annual Report of the Alumni Association, with the exercises of the 66th Commencement of the Philadelphia College of Pharmacy, for the year 1886-1887. 8vo, pp. 242.

This pamphlet contains the minutes of the Executive Board and of the annual meeting, most of the lectures delivered at the social meetings, obituary notices, interesting correspondence, commencement exercises, etc. It may be obtained from the efficient secretary, Wm. E. Krewson, Ph.G.

American Medicinal Plants.—An Illustrated and Descriptive Guide to the American Plants used as Homœopathic Remedies, their History, Preparation, Chemistry and Physiological effects. By Chas. F. Millspaugh, M.D.

Illustrated by the author. Boericke & Tafel, New York and Philadelphia. Fascicle vi. Price \$5.

The fascicle before us completes this work, which has been in preparation for several years. In our previous notices we have spoken of the scope of the work, its general arrangement, and the character of the illustrations as well as of the descriptions and statements relating to composition, and we find that the good and indifferent qualities have been pretty uniformly preserved throughout the work.

In our opinion, the usefulness of the work depends chiefly upon its value as relating to medical botany. The well-executed plates give fair and correct representations of the plants, which are colored as nearly true to nature as can reasonably be expected. In a few cases we would have preferred drawings more characteristic of the entire plants, but even in these cases we have no fault to find with the general correctness. The botanical descriptions are pretty complete, though perhaps briefer than some may desire who have paid but little attention to our wild growing plants; as a rule, they are ample for enabling an intelligent person to identify the plants. We have previously stated that a considerable proportion of the plants, thus illustrated, are not indigenous to American soil, but have become naturalized here more or less extensively, or are sometimes found growing spontaneously in certain localities. Pharmacognostical descriptions are omitted, except in a few instances.

In relation to the chemistry reported in the text, we have on various occasions pointed out errors, omissions and inaccuracies, or vague statements. The physiological action of the plants is usually briefly stated; but on this point we leave others to judge. However, one feature not previously referred to we must notice now, namely, the errors in the spelling of French and German names, which are of more frequent occurrence than is allowable in a work of reference. For instance, we should have *raifoot* (not *raifoot*), *ciguë* (not *ciguë*), *pied de lion* (not *pied d' leon*), *igname* (not *iguame*), *Bärlapp* (not *Bürlapp*), *Kolbenmoos* (not *Kalbenmoos*), *Schierling* (not *Scheiling*), *Nachtschatten* (not *Nachschaten*), etc. A number of typographical errors occur likewise in the index.

The publishers have left nothing undone to make the work attractive, even aside from the 180 plates, which alone are fully worth the price charged for the work.

Grasses of the South.—A Report on Certain Grasses and Forage Plants for Cultivation in the South and Southwest. By Dr. Geo. Vasey, Botanist, Washington: 1887. 8vo, pp. 63.

The pamphlet contains sixteen plants of southern forage plants, and has been issued by the Botanical Division of the Department of Agriculture.

Eighteenth Annual Report of the State Board of Health, of Massachusetts.—Boston: 1887. 8vo, pp. 366.

The report is for the year 1886; the portions of greatest direct interest to the pharmacist are the special reports on the examination of foods by Dr.

E. S. Wood; on milk by Drs. C. Harrington, B. F. Davenport and C. A. Goessmann; and on food and drugs, by Dr. B. F. Davenport.

Massachusetts State Agricultural Experiment Station.—Bulletins No. 25^a and 26, July and August, 1887.

These reports are prepared by the Director, Prof. C. A. Goessmann, Amherst, Mass.

Bericht der Wetteravischen Gesellschaft fuer die Gesamnte Naturkunde zu Hanau, 1885-1887, erstattet von dem Director derselben Fr. Becker, Realschul-Director. Hanau 1887. Waisenhaus-Buchdruckerei. 8vo, pp. 169.

Report of the Wetteravian Society for the Natural Sciences.

Besides the report on the affairs of the Society, the pamphlet contains an obituary of the late Prof. Dr. C. Fliedner, and a catalogue of the plants growing wild and cultivated in the district of Rotenburg, compiled by Dr. Eisenach, from collections made during a period of nearly fifty years.

The following theses from the École supérieure de Pharmacie, at Montpellier, have been received:

"De l'eau à bord"; par Chas. Dezeuze. (Water on Shipboard.) Pp. 54, with a plate illustrating Perroy's still and filter.

"Du coffre à médicaments à bord des batiments de guerre et de commerce"; par F. X. Daniel. (Medicine chests for men-of-war and merchantmen). Pp. 48.

"Des farines employées dans la Marine au port de Toulon; fabrication, achats à l'industrie, conservation, falsification, altération, analyse"; par J. Martinenq. (On flours employed in the marine at Toulon, their manufacture, purchase, conservation, adulteration, changes and analysis). Pp. 90.

"Des Anesthésiques"; par Henri Valat. (On anæsthetics). Pp. 62.

"D l'acide lactique et des lactates employés en pharmacie"; par Jacques Rouzières. (Lactic acid and lactates employed in pharmacy). Pp. 54.

"Des contre-poisons"; par J. Carles. (On counter-poisons). Pp. 64.

"De l'opium des fumeurs"; par René Pluchon. (On smokers' opium). Pp. 66.

"Étude sur le mabit et le quinquina Piton"; par Chas. Arnaud. (On the mabit (*Colubrina reclinata*) and the Piton cinchona (*Exostemma floribundum*). Pp. 36, with a plate illustrating the anatomy of the exostemma bark.

The reception of the following pamphlets is hereby acknowledged:

Kinologische studien; door Dr. J. E. De Vrij. (Quinological studies). Five numbers.

Composition du beurre naturel; par D. A. Van Bastelaer. (Composition of natural butter).

Les anciens grès artistiques flamands dans le nord de la France a la fin du XVII^e siècle; par D. A. Van Bastelaer. (Ancient Flemish artistic earthenware in the north of France, at the end of the 17th century). Pp. 26, with a colored plate.

Instructions sommaires pour les agents de la police répressive en matière d'exercice illégal des professions médicales; par D. A. Van Bastelaer. (Summary instructions for the agents of repressive police, relating to the illegal practice of the medical professions). Pp. 45.

Address of Fr. B. Kilmer, President, at the 17th Annual Meeting of the New Jersey Pharmaceutical Association.

Studies on the Stratification of the Anthracite Measures of Pennsylvania. By H. A. Wasmuth, Instructor of Mining, University of Pennsylvania. Pp. 18, with four plates of geological sections; reprint from the Journal of the Franklin Institute.

A Successful Case of Partial Incision of the Larynx. By Lennox Browne, F. R.C.S. Ed. etc. Pp. 7; reprint from the British Medical Journal.

A Review of the most Important Advances in Surgery, Medicine and Pharmacy in the Last Forty Years. By C. W. Moore, M.D., San Francisco. Pp. 16; reprint from the Pacific Record of Medicine and Surgery.

OBITUARY.

Notice of the death of the following graduates of the Philadelphia College of Pharmacy has been received:

Wm. G. Barrowman, class 1886, died at Moosic Lake, Pa., July 30th, of consumption, at the age of 21 years. He learned the business in Scranton, and after graduation was assistant in Wilkes Barre.

John P. Curran, Jr., class 1879, died at his residence in Philadelphia, August 6th, of consumption. Until about three months ago he was in business at Thirteenth and Jefferson streets.

Allen Wesley Hauck, class 1886, died in Santa Fe, New Mexico, July 27th. He was a native of Lebanon, Pa., and in his new western home had made many firm friends. While charging a soda-water fountain the apparatus exploded, wounding him so seriously that in a short time he bled to death. His body was sent to his former home.

Chas. H. McConnell, class 1886, died suddenly of congestion of the brain, July 22. He was in business in West Philadelphia with D. F. Shull & Co. as a partner.

Wm. D. Porter, class 1887, lost his life at Mahanoy Junction, Pa., while endeavoring to rescue a companion from drowning. He had been assistant in the store of Dr. C. Frueh for some time.

George S. Speaker, class 1879, died after a short illness of typhoid fever August 25th, aged 29 years. He graduated at the Boys' High School in 1875, and since that time was in the service of Mr. Whitten, Chestnut Hill, in this city.